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April 1985

Oregon Wilderness

Environmental Impact Statement

Volume III

Includes Appendices for all WSAs beginning with OR-2 plus OR 3-114

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Table of Contents

(Maps and photos for each appendix follow text)

Appendix for WSA (OR-): **Page**

2-14, Malheur River-Bluebucket Creek 1
2-23L, Stonehouse 15
2-23M, Lower Stonehouse 33
2-72C-J
& 3-114 Sheepshead Mountains Group 51
2-73H, Winter Range 109
2-74, Alvord Desert and 1-73A, East Alvord 121
2-77 Mahogany Ridge 161
2-78, Red Mountain 181
2-81, Pueblo Mountains 197
2-82, Rincon 229
2-83, Alvord Peak 259
2-84, Basque Hills 275
2-85F, High Steens and 2-86F, Little Blitzen Gorge 299
2-85G, South Fork Donner und Blitzen River 349
2-85H, Home Creek 367
2-86E, Blitzen River 385
2-87, Bridge Creek 417
2-103, Aldrich Mountain 433

Map Symbols . . . . . Inside Back Cover

Appendix to the Wilderness Environmental Impact Statement for Oregon

Malheur River/ Bluebucket Creek Wilderness Study Area (OR-2-14)

General Description of the Study Area

The Malheur River/Bluebucket Creek wilderness study area (WSA) is about 35 miles northeast of Burns (about 11 miles northwest of the community of Drewsey) in Harney County (see map 1.). The WSA is 21 miles north of U.S. Highway 20.

The study area contains 5,560 acres, all of it public land (see map 2). The area is shaped roughly like a horseshoe, with an extremely irregular boundary configuration. The boundaries on the south, west, and northeast are formed along legal subdivisions with private land. Part of the northern boundary abuts the Malheur National Forest while the southeastern boundary is formed by a road. Also forming part of the boundary are two small dead-end roads, one of which enters the WSA from the north (2 miles); the other penetrates the area for less than 1/2 mile from the east.

The WSAs topography is primarily a high tableland deeply cut by two major drainages; the Middle Fork of the Malheur River and Bluebucket Creek. The Middle Fork of the Malheur River is a perennial stream flowing from north to south through about 2 1/4 miles of public land.

The canyon is rugged and steep with a depth of 600 feet in the north and 800 feet in the south. The canyon's width varies from 1/2 to one mile. Bluebucket Creek, also a perennial stream, flows east to west, joining the Malheur River near the center of the WSA. The upper edges of the Bluebucket Creek Canyon walls are formed by basalt rimrock which drop sharply to the bottom of the drainage.

West of the Malheur River Canyon, in the northern portion of the WSA, the terrain rises gradually to an elevation of 5,200 feet, the highest point in the study area. This part of the WSA is characterized by rolling hills and several small intermittent streams which drain east into the Malheur River.

Battle Mountain, a relatively flat-topped plateau edged with rimrock, forms the southwestern corner or "leg" of the study area. The southern end of this plateau slopes down toward the southern boundary of the WSA and its lowest elevation of 3,900 feet.

Like Battle Mountain, Moffet Table, east of the river and south of Bluebucket Creek, is a relatively flat, rimrock-edged plateau which forms the southeastern leg of the study area.

The study area contains a variety of vegetation. The most common species are big sagebrush, juniper, mountain mahogany and ponderosa pine.

Interrelationships

The Malheur River/Bluebucket Creek WSA abuts the Malheur National Forest on the north.

A portion of the WSA including all of the land along the Malheur River within the WSA is in a power site reserve which earmarks the land for potential water power and storage development. This withdrawal is scheduled for review in the next few years, which may lead to its revocation. Power site development is not foreseen and therefore not discussed further.

The U.S. Fish and Wildlife Service conducts a predator control program within the southern portion of the WSA near the base of Moffet Table and Battle Mountain; it consists of aerial shooting of coyotes to reduce predator damage to livestock.

The Oregon Department of Fish and Wildlife (ODFW) conducts two population surveys within the WSA. One survey involves a census of big game while the other is concerned with fish populations. The big game survey is done twice annually, in the spring and the fall. The fish survey is done periodically, every three to five years. Both programs use aircraft for observation or access.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- existing commercial forest and timber harvest in the area,

- proposed stream habitat improvements, and

- potential exploration and development of energy and mineral resources.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness (preferred alternative)
- no wilderness/no action

An enhanced alternative is not analyzed for this study area because the primary opportunity to enhance wilderness values, closing the 2 1/2 miles of dead-end roads which penetrate the area, would not provide an alternative substantially different from the all wilderness alternative.

A partial alternative is not analyzed because eliminating conflicts between wilderness and timber and minerals (diatomite) by recommending part of the area nonsuitable would not leave an area of sufficient size to retain wilderness values.

All Wilderness (Preferred Alternative)

The all wilderness alternative would recommend all 5,560 acres of public land in the WSA suitable as wilderness (see map 2). For purposes of analysis, it is assumed there would be no acquisition of adjacent private land. The two dead-end roads which enter the WSA would remain open to vehicle use.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- closure of a portion of the WSA (2,000 acres along the drainages) to timber harvest, construction of powerlines or pipelines, and to off-road vehicle use (the area would remain roadless).

On the remainder of the lands outside this 2,000-acre portion:

- continued vehicle use; and
- potential timber harvest on 22 acres.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 1. Summary of Proposed Management Under Each Alternative, Malheur River/Bluebucket Creek WSA (OR-2-14)

Proposed Management	All Wilderness	No Wilderness/No Action
Acres Designated as Wilderness	5,560	0
Acres Closed to ORVs by Wilderness Designation [1]	3,560	0
Miles of Ways Closed	4	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	5,560	0
Structural Wildlife Projects Developed: Stream Channel Projects (number) [2]	0-1	1
Acres of Timber Available for Harvest	0	22
Average Annual Volume of Timber Sold (Mbf-Thousand Board Feet)	0	1.5

[1] Approximately 2,000 acres are already closed to ORVs under the current land use plan.

[2] The project involves placement of 25 stream structure and 250 boulders.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The Malheur River/Bluebucket Creek WSA would be manageable as wilderness under the all wilderness alternative. However, some manageability problems could be expected.

Much of the area is bounded by private lands. Although nearly half of the boundaries can be identified by fences, the rest have no identifying features whatsoever. Visitors to the area might wander onto private land if the boundaries are not marked, but the problem could be resolved by posting signs on the boundary. The greatest need for signs would be where the major drainages cross the northern, eastern, and southern boundaries. These areas would receive the most recreation use.

The development of adjacent private lands could also be a manageability problem. Although no development is planned at this time, development of adjacent lands south of the WSA would be visible from various portions of the study area and could have an adverse effect on the perception of naturalness in the area.

The roads which enter the WSA could cause management problems if vehicle use increased. Presently these roads are used infrequently, primarily for hunting access, and the situation is not expected to change.

The manageability problems of the WSA are not sufficient to preclude designation and management of the area as wilderness.

Rationale for the Selection of the Preferred Alternative

The all wilderness alternative is preferred because of the many wilderness values within the area. In addition to being in a natural condition and possessing outstanding opportunities for solitude, the study area provides several high quality recreational opportunities. Despite its relatively small size, the area offers excellent opportunities for hiking, fishing and sightseeing.

Potential management problems caused by the area's irregular configuration and boundaries with private land, and the potential value of the area for energy (oil and gas) or mineral (diatomite) development do not outweigh the value of this area for wilderness.

Affected Environment

This section discusses only those activities or resources which influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Malheur River/Bluebucket Creek WSA is in a relatively natural condition. None of the man-made features within the study area is substantially noticeable and most of the features can be seen from only a very small portion of the WSA.

The WSA contains 19 developments which influence approximately 7 percent of the study area. (The area of influence is an estimate of the acreage in the WSA from which these man-made features can be seen.) Of this total there are 6 reservoirs, 3 developed springs, 5 ways (a vehicle route established and maintained solely by the passage of motor vehicles) totaling about 4 miles, and 5 fences totaling about 1 3/4 miles.

Table 2. Summary of Environmental Consequences of Alternatives, Malheur River/Bluebucket Creek WSA (OR-2-14)

Resource or Activity	All Wilderness (Preferred Alternative)	No Wilderness/No Action
Wilderness Values	Would add 5,560 acres to NWPS. Maintain or improve the quality of wilderness characteristics and special features. It includes the Middle Fork of the Malheur River, Bluebucket Creek and their associated scenic and wildlife values. Closure of 4 miles of ways would enhance the area's naturalness and improve opportunities for solitude and primitive recreation. The area is manageable as wilderness although manageability problems could result from the configuration of the study area and adjoining private lands.	Wilderness values and special features would be subject to disturbance from potential energy and mineral development.
Energy and Mineral Development	Development precluded on 5,560 acres, including 5,560 acres with moderate potential for diatomite and oil and gas.	No impact.
Vegetation	Vegetation preserved.	Timber removal on 22 acres may allow ecological succession toward a late-seral community. No significant impact.
Wildlife	Wildlife habitat preserved. Proposed fishery habitat improvement projects may be precluded and opportunity to increase fish population by 1,375 foregone.	Fishery improvement projects would increase trout populations by 1,375.
Wood Products Harvest	Harvest of an average of 1.5 Mbf per year foregone.	Harvest of an average of 1.5 Mbf per year.
Recreation Use	Restricting motorized vehicles to dead-end roads would have only a slight effect on recreation use. Primitive recreation use would likely increase. Overall, no change in recreation use; possible slight increase if fish habitat improved.	Primitive recreation would be the dominant activity within the restricted roadless area. These activities would be subordinate to existing motorized uses outside this zone. Fishing would increase only slightly with the addition of 1,375 trout, with net increase in overall recreation use.
Economic Value and Local Income	Decrease in economic value and local personal income by $56 and $293, respectively, if timber is not harvested, and if proposed projects are not constructed. Increase in economic value and local personal income by $83,718 and $48,727 respectively, if timber is not harvested and proposed projects are constructed.	Increase in economic value and local personal income by $83,774 and $49,020 respectively, from construction of proposed projects.

The northwest third of the WSA contains 4 of the 6 reservoirs, the 3 developed springs, and 3 1/2 miles of ways. Even though there are many developments in this area, the topographic and vegetative screening limit the area of influence.

The fences in Bluebucket Creek Canyon and north of Battle Mountain Ridge are well screened by topography and vegetation, while the fences on Moffet Table and on Battle Mountain plateau occur in relatively flat terrain lacking sufficient vegetative screening.

A reservoir on the east side of Moffet Table can be seen from the slightly higher land around it. A way about one-eighth of a mile long leads to the reservoir and is unnoticeable.

A reservoir on the west side of the Battle Mountain plateau can be seen from a ridge to the northeast. A way less than one-half mile long leads to this development.

Outside sights or sounds do not have a major adverse effect on the study area. The primary source of outside sights and sounds is the boundary roads and fences. Additionally, several reservoirs, ways, ranching activity in the valley to the south, and a ditch along the Middle Fork of the Malheur can be seen from within the area.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude in the Malheur River/Bluebucket Creek WSA are outstanding. The opportunities are enhanced by topographic and vegetative screening but are limited by the size and configuration of the WSA.

The northern plateau has diverse topography with rugged side drainages which provide good topographic screening. The Malheur River and Bluebucket Creek canyons, coupled with their intermittent drainages and the steep slopes of the southern plateaus, all serve to provide numerous screening opportunities. The flat southern plateaus do not provide any topographic screening.

Vegetative screening which enhances solitude occurs in Bluebucket Creek and in portions of the Malheur River canyon. There are scattered areas of vegetative screening on the northern plateau, but Moffet Table and Battle Mountain plateau contain very limited vegetative screening.

Size and configuration of the WSA have an impact on wilderness values. The small size and irregular horseshoe shape could restrict movement of a user within the WSA. The two narrow 'legs' in the south are plateaus on either side of private land along the Middle Fork of the Malheur River. These circumstances would tend to concentrate visitor use in certain areas (primarily the drainages) and reduce the ability of the visitor to find a secluded spot on the southern plateaus.

The area provides outstanding opportunities for primitive forms of recreation. These activities include day hiking, camping, backpacking, fishing, hunting, sightseeing and photography.

Though limited by size, the WSA provides outstanding opportunities for day hiking. Major attractions are the Middle Fork of the Malheur River and Bluebucket Creek. Hikers would use a drainage on the northeast side of Moffet Table to reach Bluebucket Creek. A challenge to the hiker, this entry drainage is steep, interesting and heavily vegetated. Bluebucket Creek canyon and Malheur River canyon would also be attractive to the day hiker.

These features would also be attractive to the backpacker and camper. Level areas suitable for camping are found along the Malheur River and in a few places along Bluebucket Creek. Water is available throughout the study area. The small size of the WSA would limit most trips to 2-3 days.

Opportunities for fishing are outstanding along the Middle Fork of the Malheur River. Fishing opportunities would be limited to about three miles of river, because an angler would encounter private land on both the northern and southern WSA boundaries. Bluebucket Creek supports fewer, smaller trout than the Malheur River, but it provides a fair opportunity for fishing.

Game species which can be hunted include mule deer, elk and upland game birds. Opportunities for deer hunting are good but they are limited by the small size of the area. Elk hunting opportunities range from poor to fair and are associated with Malheur National Forest lands to the north. Of the several upland game species present, hunting for chukar provides the best opportunities.

Opportunities for sightseeing and photography are also outstanding. Beautiful terrain can be seen both within and outside the WSA. The rugged rimrock-lined Middle Fork of the Malheur River and Bluebucket Creek canyons with their diverse vegetation provide many subjects for photography.

Special Features

The WSA contains redband trout, a native fish with limited range.

The area provides crucial winter range for deer. This crucial winter range is located on the Battle Mountain plateau area and portions of Moffet Table.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the WSA is in the Intermountain Sagebrush Province and the potential natural vegetation is sagebrush steppe.

Nine ecosystems listed in the Ochoco, Blue and Wallowa Mountains section of the Oregon Natural Heritage Plan occur in this WSA. On the tablelands the communities are big sagebrush/bunchgrass, low sagebrush/bunchgrass and rigid sagebrush scabland. On the slopes and hillsides, the communities are western juniper/bluebunch wheatgrass, western juniper/big sagebrush, ponderosa pine/bitterbrush/bunchgrass and a ponderosa pine/bunchgrass community with separate areas of Idaho fescue and bluebunch wheatgrass. A mountain mahogany/bunchgrass community is scattered throughout the area and along the streams the community is a low elevation riparian forest with cottonwood, hawthorn, and alder.

The study area is within 5 hours' driving time of three standard metropolitan statistical areas with population over 100,000: Boise, Idaho; and Richland/Kennewick/Pasco, Washington.

Energy and Mineral Development

The geology, energy and mineral resources of the Malheur River/Bluebucket Creek WSA were evaluated by interpreting existing literature, reviewing mining claim and mineral leasing records and correlating rock units in the WSA with similar environments in areas known to contain mineral resources. Technical details of the evaluation are in a report for the Castle Rock Geologic Resource Area, Grant, Harney and Malheur Counties, Oregon, prepared by TERRADATA, a consulting firm under contract with BLM.

The WSA is within the Castle Rock geologic resource area, which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA is rated moderately favorable for the occurrence of oil and gas based on the possibility that favorable source and host rocks are present beneath the thick cover of Tertiary volcanics and sediments. There were no oil and gas leases in the WSA as of January 1, 1984; nor were there any geothermal leases.

Sedimentary rocks beneath the younger basalt flows in the WSA are rated moderately favorable for the occurrence of diatomite. Significant deposits of diatomite occur in similar sedimentary rocks southeast of the WSA. During a brief field examination, no exposures of diatomite were observed within the WSA. There were no mining claims in the WSA, as of January 1, 1984.

Table 3 shows the mineral potential classifications for the WSA.

Surface rocks in the WSA are mostly tertiary basalt flows overlain by tuffaceous sedimentary rocks which in turn are capped by the younger basalt flows comprising Moffet Table and Battle Mountain. Very little is known about the underlying pre-Tertiary rocks.

Vegetation

In the Malheur River/Bluebucket Creek WSA, distinctive types of vegetative communities are associated with the tables or plateaus, the slopes, the steep hillsides and the riparian areas.

There are three areas of tableland. The northern area is a big sagebrush/low sagebrush/bunchgrass type. The Battle Mountain Table is a low sagebrush/bunchgrass type. Moffet Table is a stiff sagebrush scabland. The species in this type include stiff sagebrush, low sagebrush, Sandberg's bluegrass, bluebunch wheatgrass and bottlebrush squirreltail.

The estimated successional stage of the low sagebrush communities is mid-seral and the climax species are probably low sagebrush, bluebunch wheatgrass, and Idaho fescue. (Seral refers to a

Table 3. Classification of Energy and Mineral Potential, Malheur River/Bluebucket Creek WSA (OR-2-14)

Commodity	Area	Classification Level	Confidence Level
Metals	Entire WSA	1	A
Geothermal	Entire WSA	1	B
Uranium/Thorium	Entire WSA	1	A
Coal	Entire WSA	2	B
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	C
Bentonite	Entire WSA	2	A
Diatomite	Entire WSA	3	A
Zeolites	Entire WSA	2	C

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) The stiff sage/low sage scabland is mid-seral with stiff sage and Sandberg's bluegrass being the probable climax species.

The slopes are a big sagebrush/bunchgrass type. There are junipers scattered throughout much of this type. There are also patches of mountain mahogany on some areas. This area includes western juniper, big sagebrush, bluebunch wheatgrass, Idaho fescue, Sandberg's bluegrass, prairie junegrass and mountain mahogany. The successional stage of the big sagebrush communities is mid-seral. Probable climax species are big sagebrush, bluebunch wheatgrass, Idaho fescue, Sandberg's bluegrass and prairie junegrass. Western juniper may be present in small amounts in the climax community.

Steep hillsides occur along the Malheur River and Bluebucket Creek. The north facing slopes are a ponderosa pine/wheatgrass community. There is also a small amount of Douglas fir along Bluebucket Creek. The south facing slopes are dominated by bunchgrass. The species occurring here are bluebunch wheatgrass, Idaho fescue, Sandberg's bluegrass and some forbs. The successional stage of both communities on the steep hillsides is mid-seral. The climax species in the ponderosa pine community include ponderosa pine, big sagebrush, bitterbrush, mountain mahogany, bluebunch wheatgrass and Sandberg's bluegrass. The climax species in the bunchgrass community are probably bluebunch wheatgrass, Idaho fescue, Sandberg's bluegrass and some forbs.

The riparian areas are closely associated with the Malheur River and Bluebucket Creek. Western juniper, ponderosa pine, Douglas fir, quaking aspen and cottonwood form the overstory. Shrubs include redosier dogwood, wax currant, Pacific willow, mountain alder, Wood's rose, Lewis' mockorange, and chokecherry. Grasses and forbs include redtop, Kentucky bluegrass, sagewort and many others. These areas are probably in a late-seral stage. The climax species are unknown, but it is likely that most species present are climax species except for Kentucky bluegrass.

Wildlife

Wildlife species which occur in the WSA include those normally found in the sagebrush, juniper/ponderosa pine and riparian habitats. Cliffs, talus and rugged canyons provide additional habitat for many species.

A small number of resident mule deer and elk occur in the WSA. The southern portions of Battle Mountain plateau and Moffet Table provide crucial deer winter range. There is yearlong elk range in the northern third of the WSA, but elk use in this area is very sporadic.

The Middle Fork of the Malheur River and Bluebucket Creek support redband trout--a native fish having limited range and declining habitat--rainbow trout and mountain whitefish. Nongame aquatic species include coarsescale suckers, squawfish, chiselmouth, redside shiners and dace.

Game birds in the WSA include chukar, ruffed grouse, blue grouse, valley quail and mourning doves. These are present in limited numbers. Songbirds in the WSA are canyon wren, western meadowlark, Clark's nutcracker, Stellar's jay, yellow-bellied sapsucker, common flicker, sage thrasher and Brewer's sparrow.

Sage grouse, golden eagles and antelope may be in the WSA at times, but no strutting grounds, nest sites or kidding grounds have been identified.

Other wildlife species found in the WSA include bushy-tailed woodrat, canyon mouse, long-eared myotis (bat), great basin pocket mouse, black-tailed jackrabbit, mountain cottontail and yellow pine chipmunk.

Proposed fishery habitat improvements include the construction of 25 in-stream structures made of logs, wire and vinyl material and placement of 250 boulders in the Middle Fork of the Malheur River. These proposed projects would improve the pool-to-riffle ratio and increase the trout population in the 2.5 miles of the Middle Fork of the Malheur River by an estimated 1,375 individuals.

Livestock Grazing

The WSA contains portions of three grazing allotments. Table 4 summarizes existing livestock use in AUMS (animal unit month, the amount of forage needed to sustain by one cow and calf, or equivalent animals, for one month). Approximately 120 acres of the WSA does not have a grazing permit and is not managed under an allotment management plan for livestock use.

Table 4. Existing Livestock Use, Malheur River/Bluebucket Creek WSA (OR-2-14)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual in WSA (AUMs)
River FFR (No. 5570)	60	09/01-10/31	60	36
Sunshine Fld. (No. 5545)	53	06/01-09/30	19	10
Moffet Table (No. 5511)	1,831	04/15-09/30	33	604
Unalloted	0	None	100	0
Totals	1,944			650

No livestock improvements are proposed within the WSA. Existing improvements (among the man-made features discussed in the Naturalness section) include 6 reservoirs, 3 spring developments, and 1 3/4 miles of fencing.

The grazing operators presently use motor vehicles for access within and around the WSA. The boundary roads and ways are used for salting and general livestock supervision. Horses are used to move and gather livestock.

Wood Products Harvest

Malheur River-Bluebucket Creek WSA contains 178 acres of commercial forest land. Of this total, 131 acres are not available for harvest because the sites are too rocky or otherwise not harvestable. Of the remaining 47 acres, 25 acres are within an area for which BLM's land use plan precludes timber harvesting. The other 22 acres do contain harvestable timber and contribute an estimated 1,500 board feet (1.5 Mbf) per year to BLM's annual programmed timber harvest in the Burns District.

Recreation Use

Recreation use in the Malheur River/Bluebucket Creek WSA is primarily oriented toward hunting and fishing. Mule deer, elk and upland game birds are the most commonly hunted game species but use for all hunting is low.

High quality trout fishing occurs along three miles of the Middle Fork of the Malheur River and current visitor use low.

Fishermen approach the study area by vehicle, then must hike in to reach the Malheur River and Bluebucket Creek.

Most hunting in the area involves use of motor vehicles. There is good access to the WSA along the southeast boundary road and the dead-end road leading into the northern portion of the WSA.

Economic Value and Local Income

Livestock grazing, timber and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

Economic value and local personal income generated from existing levels of resource outputs of these lands are presented in table 5. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 5,560

Table 5. Economic Value and Local Personal Income Generated Annually, Existing Program, Malheur River - Bluebucket Creek WSA (OR-2-14)
(1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	650	$ 4,901	$ 5,421
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Timber	MBF	1.5	56	293
Total			4,957	5,714

acres to the National Wilderness Preservation System (NWPS), including three large plateaus (the northern plateau, Battle Mt. Plateau and Moffet Table) deeply cut by the Middle Fork of the Malheur River and Bluebucket Creek.

Wilderness designation under this alternative would maintain or improve the natural qualities of the area as well as outstanding opportunities for solitude and primitive types of recreation. Closure of five vehicle ways totaling four miles, would improve the naturalness of the area by eliminating most vehicle use and allowing the ways to revegetate. Closing the ways would also improve opportunities for solitude and improve the quality of primitive recreation by eliminating motor vehicles. Wilderness designation would also protect the crucial deer winter range in its present condition.

Under the **no wilderness/no action alternative**, wilderness values would be subject to disturbance from energy and mineral development and timber harvest (except in 2,000-acre area where timber harvest would be precluded, according to current land use plan).

Surface disturbing activities such as mining or timber harvest would adversely affect the naturalness of the area. Opportunities for solitude would be adversely affected as a result of any additional vehicle access and possible mining or timber operations. Primitive recreation could be adversely affected by projects or mining activities depending on their location and the extent of disturbance to recreation attractions. The crucial deer winter range identified as a special feature, as well as and elk and other wildlife habitat, would not be protected from development within the WSA.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development. Under the **all wilderness alternative**, 5,560 acres would be withdrawn. All of this acreage has moderate potential for the occurrence of diatomite and oil and gas.

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Vegetation

Areas designated wilderness would not be subject to most surface disturbing activities. Vegetation dependent upon the existing undeveloped environment would thus be maintained under the **all wilderness alternative**.

Under the **no wilderness/no action alternative**, timber harvest would remove the ponderosa pine and Douglas fir trees on up to 22 acres. Removal of the mid-seral ponderosa pine, along with the Douglas fir (a climax species), may allow a more rapid advancement of ecological succession toward a late-seral community, if regrowth is Douglas fir.

Effects on Wildlife

Wildlife habitat would be preserved under the all wilderness alternative.

The **all wilderness alternative** could result in the loss of opportunities to improve habitat. The proposed installation of 25 in-stream structures and 250 boulders in the Middle Fork of the Malheur River might or might not be allowed under this alternative, depending on a site-specific assessment of whether they conform with Wilderness Management Policy. If these projects are not allowed, the opportunity to increase the trout population by 1,375 individuals would be foregone.

Under the **no wilderness/no action alternative**, installation of fish habitat improvements could increase the trout population by 1,375. None of the old growth timber in the WSA is on the 22 acres that would be included in the timber harvest program.

Effects on Wood Products Harvest

The **all wilderness alternative** would preclude harvest within the entire study area. As a result, 22 acres which contribute 1.5 Mbf per year would not be harvested. The remaining 156 forested acres would not be harvested because of rocky or inaccessible conditions (131 acres) or because current land use plans already preclude harvest (25 acres).

Under the **no wilderness/no action alternative**, 22 acres of forested land could be harvested and contribute an average of 1.5 Mbf per year of timber to BLM's programmed harvest in the Burns District.

Effects on Recreation Use

Under the **all wilderness alternative**, the quality of and opportunities for primitive recreation would be maintained at their present level or improved. Improvements would occur as a result of the elimination of vehicle use on ways throughout the WSA.

Hunting would probably be the activity most affected by the closing of vehicle ways. It is not expected that this will be a substantial reduction in visitor use, and any reduction in hunter-visitor days from the loss of vehicle-oriented hunting may be offset by increased use from hunters who do not use vehicles within their hunting area.

Although existing use of the area for primitive recreation is limited, it is expected that, under the all wilderness alternative, such use would likely increase due to the many attractions of the WSA. The expected increase in primitive recreation use may be sufficient to offset any loss of vehicle-oriented recreation. A slight increase in recreation use could occur under the all wilderness alternative if the proposed fish habitat improvements were made.

Under the **no wilderness/no action alternative**, primitive types of activities would continue to be subject to disturbance from existing vehicle access routes and use. Primitive recreation could be disturbed by timber harvest. Recreation use could increase slightly if the proposed fish habitat improvements were made. Vehicle-dependent recreation could benefit from additional access provided by development. The only substantial effect on overall recreation use under this alternative would be an increase in fishing activity generated by the fish habitat improvements.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 6 and 7. Table 6 shows the effects on economic value and table 7, the effects on local personal income. It is not known at this time whether individual proposed structural improvements would be constructed if the area were designated wilderness. The column for the all wilderness alternative shows the effects as a range of values dependent upon whether these structural improvements were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The all wilderness alternative would restrict such vehicle use unless there were no practical alternative. There would be no impact and no increase in costs to the grazing operators from road closures in the WSA.

Table 6. Effects of Alternatives on Annual Economic Value, Malheur River - Bluebucket Creek WSA (OR-2-14) (1981 price 1evels)

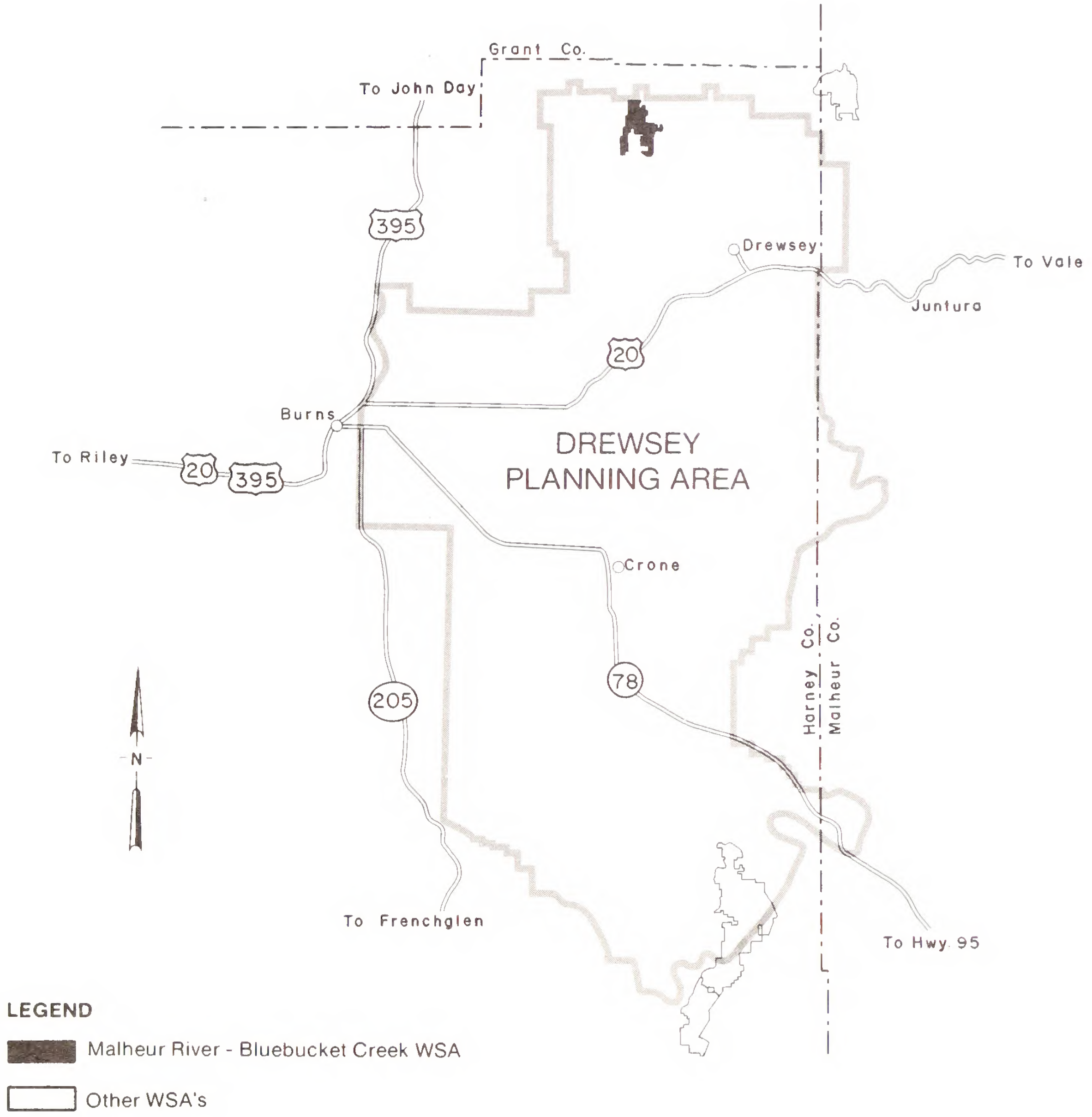
Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Timber	MBF	-1.5	0
Fishing [1]	RVD	0 to +4,300	+4,300
VALUE OF PLANNED INVESTMENTS [2]			
Fishing	$	0 to +85,355	+85,355
Investments [3]	$	0 to -1,611	-1,611
Net Economic Value	$	0 to +83,744	+83,744
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS			
Timber	$	-56	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS			
All categories	$	-56 to +83,688	+83,744

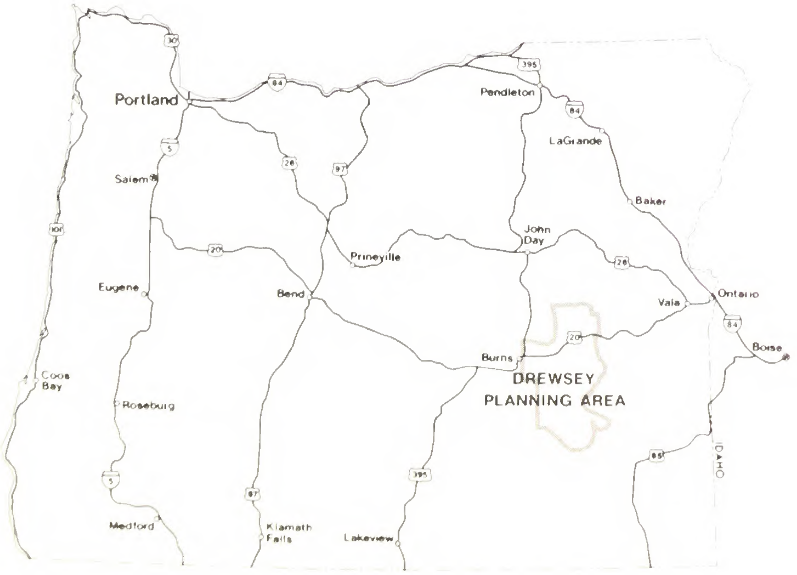
[1] Expected future increases from proposed structural projects.
[2] Structural projects involving up to $20,000 in total expenditures.
[3] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

Table 7. Effects of Alternatives on Local Personal Income, Malheur River/Bluebucket Creek WSA (OR-2-14) (1981 price levels)

Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Timber	MBF	-1.5	0
Fishing [1]	RVD	0 to +4,300	+4,300
INCOME FROM PROPOSED INVESTMENTS [2]			
Fishing	$	0 to +49,020	+49,020
Construction Activity [3]	$	0 to +2,687	+2,687
Total [4]	$	0 to +49,020	+49,020
INCOME FROM OTHER EXPECTED OUTPUT CHANGES			
Timber	$	-293	0
INCOME FROM ALL OUTPUT CHANGES			
All categories [4]	$	-293 to +48,727	+49,020

[1] Expected future increases from proposed structural wildlife projects.
[2] Structural projects involving up to $20,000 in total expenditures.
[3] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from timber harvest fishing activity because it is not sustained over the analysis period.
[4] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 1.





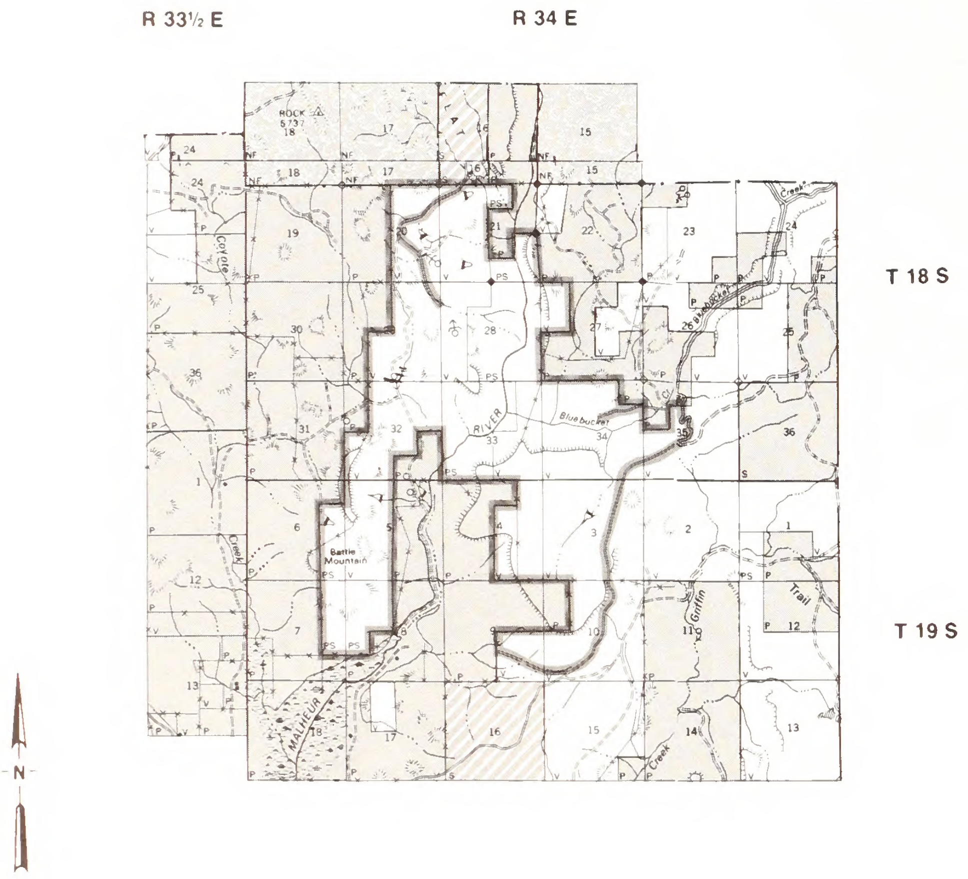
U. S. Department of the Interior
Bureau of Land Management

Burns District

Malheur River - Bluebucket Creek WSA
OR-2-14

LOCATION MAP

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

☐ Bureau of Land Management

▨ State

☐ Private

☐ U.S. Forest Service

U. S. Department of the Interior
Bureau of Land Management
Burns District

Malheur River - Bluebucket Creek WSA
OR-2-14

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2

Malheur River-Bluebucket Creek WSA, OR-2-14. Looking upstream (east) at Bluebucket Creek above the confluence with the Malheur River. This area is recommended suitable under the preferred (all wilderness) alternative. The relatively flat tableland which is deeply cut by the drainages is prominent on the right and left. August 1983.

Malheur River-Bluebucket Creek WSA, OR-2-14. Part of the tableland in the northwest portion of the study area. Within the area recommended suitable under the preferred (all wilderness) alternative. The view to the northwest shows the rolling terrain and typical vegetation. August, 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Stonehouse Wilderness Study Area (OR-2-23L)

General Description of the Study Area

The Stonehouse wilderness study area (WSA) is located about 50 miles southeast of Burns in Harney County (see map 1). The area is adjacent to the county road which runs between State Highway 78 (at Folly Farm) and Fields. The state highway is 8 miles northeast of the WSA.

The study area contains 21,000 acres of public land in an elongated, roughly crescent shape (see map 2). The WSA is 13 miles long and 5 1/2 miles wide at the extremes. The boundaries are irregular and a small head-shaped peninsula protrudes from the northern end. The study area contains 3 parcels of private land totaling 920 acres and one 320-acre parcel of split-estate land (federally managed surface, state or privately owned subsurface mineral rights). All of these inholdings are located in the northern half of the WSA.

On all sides of the study area, the boundaries are formed by a combination of private land and roads. A very small part of the boundary on the eastern side of the WSA is formed by a parcel of split-estate land. In addition, a dead-end road which enters the WSA for 1 1/2 miles on the northwestern side of the area, and a 160-acre parcel of private land make up part of the study area's northwestern boundary.

Topography in the Stonehouse area varies from very steep rock walls to wide, flat basins. The WSA is located on the northern end of the Steens Mountain fault block. Like other WSAs occurring along the east rim of the Steens, the area has a high, steep, east-facing escarpment, and gentle, open, west slopes. The highest elevation in the WSA is 7,200 feet at Stonehouse Peak along the escarpment. The lowest point is 4,100 feet at the base of the escarpment near the eastern boundary.

Steens Rim, with a 2,000-foot rise, dominates the study area, running northeast along the eastern side of the WSA. The rim is cut by many shallow but steep east-flowing drainages. A few of these are spring-fed intermittent streams. Squaw Creek, near the center of the WSA, is the largest of these drainages and is the only perennial stream in the area. Stonehouse Creek, which runs along the southern boundary, is intermittent but is a major and well-known drainage in the area.

The northwest and central portions of the WSA contain gently rolling hills and depressions, all sloping west. There are three intermittent lakes in the center of the area partially surrounded and separated by rocky escarpments rising as high as 400 feet. The largest of the lakes is Squaw Lake.

The northern quarter of the area is noticeably different from the rest, as it lies several miles west of Steens Rim. This part contains Oriana Flats (a wide, open valley) as well as numerous other flat areas and rolling hills.

Vegetation in the study area includes scattered juniper which are quite dense on the east-facing slopes and on the sides of the drainages. Some mountain mahogany is mixed with the juniper in the higher elevations and there are a few stands of aspen in the wetter locations near springs and drainages. Big and low sagebrush as well as a variety of grasses are found throughout the area.

Interrelationships

Adjacent to the southern boundary of the study area is the Lower Stonehouse wilderness study area (OR-2-23M). It is separated from the Stonehouse WSA by a BLM/private road and a small amount of private land. The road is maintained on an as-needed basis and provides access to the northern portion of Steens Mountain for grazing permittees, private landowners, recreationists, and BLM personnel.

The Oregon Department of Fish and Wildlife (ODFW) conducts two aerial census observations each year on the area's deer and antelope populations. For comparison, a census is also taken via horseback in this study area.

The U.S. Fish and Wildlife Service conducts a predator control program in the WSA to reduce to predator damage to livestock by aerially shooting coyotes.

Most of the WSA is in the Riddle Mountain wild horse herd management area (HMA), and a small area on the eastern edge is in the Heath Creek-Sheepshead HMA. HMA management will not be significantly affected by any of the alternatives.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- proposed range improvements,

- potential mineral development,

- vehicle-oriented recreation use in the area, and

- management of wild horses in the WSA (see Statewide EIS volume).

Also identified as an issue was the possibility of combining this WSA with the adjacent Lower Stonehouse WSA to the south.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- partial
- no wilderness/no action (preferred alternative)

An alternative recommending closure of the southern boundary road and combining the Stonehouse WSA with the Lower Stonehouse WSA to the south is not analyzed because of the significance of the boundary road. The Stonehouse road provides primary access to the upper elevations of the northern portion of Steens Mountain from the eastern side of the mountain. The road is heavily used by hunters in the fall, in addition to use by ranchers and BLM personnel.

Also, an enhanced alternative which would recommend closure of the dead-end road and the acquisition of the private and split-estate inholdings is not analyzed because it would not be substantially different from the partial alternative.

All Wilderness

The all wilderness alternative would recommend all 21,000 acres of public land in the Stonehouse WSA suitable as wilderness (see map 2). For purposes of analysis, under this alternative, it is assumed the private and split-estate inholdings would not be acquired. The dead-end road which enters the area would remain open to vehicles.

Partial

The partial alternative would recommend 19,990 acres of public land suitable as wilderness (see map 3). The 1 1/2 mile dead-end road which enters the area would be closed. In addition, an attempt would be made to acquire private and split-estate land along the boundary and within the WSA through purchase or exchange with willing landowners. The acquisitions would include a 320-acre inholding of split-estate land and 3 inholdings of private land totaling 920 acres. Parcels acquired along the boundary would include 1,655 acres of private land and 10 acres of split estate. Assuming acquisition of these 2,905 acres, the total area recommended suitable under this alternative would be 22,895 acres.

Some 1,010 acres of the WSA would be recommended nonsuitable.

Boundary adjustments recommended under this alternative would affect all sides of the WSA. The adjustments would be made to avoid conflicts with a proposed vegetative manipulation project and to improve the manageability of the study area.

Part of the southeastern boundary would be the 4,500-foot elevation contour. This would improve the identification of the boundary in this area and allow for a sagebrush control project on an old crested wheatgrass seeding. On the northeast, acquisition of parcels of private land which cut into the study area would improve the configuration of the area and the identification of the boundary. The boundary would follow an existing road.

On the western boundary in the central portion of the study area, another parcel of private land which cuts into the WSA would also be proposed for acquisition. In this area, the boundary would follow the top of a ridgeline, helping to improve the identification of the boundary on the ground. A private parcel at the end of the dead-end road to be closed would also be acquired on the western side of the WSA.

The southern boundary would follow the Stonehouse road along its entire length. Acquisition of some private land in this area would help to improve the identification of the boundary.

The area recommended nonsuitable for wilderness woudl allow for brush control and potential oil and gas exploration and development. Part of the nonsuitable area is covered by an oil and gas lease. However, the entire WSA has been identified as having low potential for the occurrence of oil and gas resources.

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- closure of a portion of the WSA (6,500 acres in the upper elevations around Squaw Lake) to off-road-vehicle use and to development of livestock facilities, new roads or trails, and energy transmission or material transport (powerlines or pipelines);

- continued use of vehicles in the accessible portions of the WSA outside the 6,500-acre portion mentioned above, primarily for recreation (hunting)

- implementation of proposed livestock improvement project (brush control) in the southeastern corner of the WSA, and

- continued availability for energy and mineral development, including exploration and possible development of both diatomite and oil and gas resources.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

Although the Stonehouse WSA is manageable under both the all wilderness and partial alternatives, the study area does have some manageability problems. The manageability problems include the long-standing use of vehicles for recreation in the area, the presence of several private and split-estate inholdings, and the substantial amount of adjacent private land.

Hunting is a popular recreational activity throughout most of this WSA. Many of the hunters use vehicles to gain access within the upper elevations of the

Table 1. Summary of Proposed Mangement Under Each Alternative,Stonehouse WSA (OR-2-23L)

Proposed Management	All Wilderness	Partial	No Wilderness/ No Action
Acres Designated as Wilderness	21,000	19,990	0
Acres Closed to ORVs by Wilderness Designation [1]	14,500	13,490	0
Miles of Roads Closed	0	1.5	0
Miles of Ways Closed	14	13	0
Acres of Full Fee Estate Acquired [2]	0	2,575	0
Acres of Split Estate Acquired [2]	0	320	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	21,000	19,990	0
Vegetative manipulation for Livestock: Brush Control without Seeding (acres)	0	1,010	1,010

[1] A total of 6,500 acres are already closed to ORVs under the current land use plan.

[2] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

area (western side). Although much of this vehicle use is confined to the boundary roads, the use of ways (vehicle routes established and maintained solely by the passage of vehicles) and cross country access also occurs. Because the area has been used this way for many years, management of the area to prohibit vehicle use and protect wilderness values would be difficult.

The private and split-estate inholdings within the study area could present management difficulties under the all wilderness alternative. Development on these parcels, although not known to be planned at this time, and the need for access across public lands would make it hard to manage this area to preserve its wilderness qualities. These inholdings are not fenced or otherwise identified on the ground. Even though these parcels are located away from the primary recreation attraction of the area (the ridgeline), recreationists could also visit portions of the wilderness next to the parcels.

Visitors might wander onto the private land, and acquiring these parcels as proposed under the partial alternative would eliminate this potential management problem.

Rationale for Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because the benefits of retaining opportunities for resource development and the use of vehicles in the area outweigh the benefits of preserving wilderness values and because of the difficulties in managing the area to preserve its wilderness values.

The Stonehouse WSA is in a natural condition and has outstanding opportunities for solitude and primitive recreation. A portion of the area, however, has potential for rehabilitation of an old crested wheatgrass seeding through a brush control project, while another part of the WSA has moderate favorability for the occurrence of diatomite. In addition, the study area would be difficult to manage as wilderness due to the traditional vehicle-oriented use from hunters, and the lack of identifiable boundaries.

Affected Environment

This section discusses only those activities or resources which influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Stonehouse WSA is in a relatively natural condition. None of the man-made features is substantially noticeable.

There are 30 man-made features in Stonehouse WSA, including 2 reservoirs, 13 ways totaling about 14 miles, 2 ditches totaling about 2 miles, 2 fences totaling 1 mile and 1 airplane landing strip.

Approximately 12 percent of the study area is influenced by these features. (The area of influence is an estimate of the acreage within the WSA from which each feature can be seen.)

The airplane landing strip, above Tommies Place in the northwest corner, is one of the larger developments. It is adjacent to the boundary road and is considerably less noticeable than the road. Sagebrush has been bladed off for the landing area, but the strip has not been cut into the hillside and is not substantially noticeable.

The reservoirs are scattered throughout the WSA with a small concentration on the western side.

Table 2. Summary of Environmental Consequences of Alternatives, Stonehouse WSA (OR-2-23L)

Resource or Activity	All Wilderness	Partial	No Wilderness/No Action (Preferrred Alternative)
Wilderness Values	Would add 21,000 acres to the NWPS. Maintain the present level or improve the quality of wilderness characteristics and protect the scenic qualities associated with the escarpment of the Steens Mountain. Closure of 14 miles of ways would enhance the area's naturalness and improve opportunities for solitude and primitive types of recreation. Although manageability problems occur, the area is manageable as wilderness.	Would add 22,895 acres to NWPS, assuming 2,905 acres of private and split-estate land could be acquired. Effects in suitable portion same as all wilderness. The area recommended suitable is manageable as wilderness. The area recommended as nonsuitable would be subject to disturbance from development, but it contains few wilderness values.	Except for mineral uses, 6,500 acres in the WSA would be closed to development and vehicle use under the current land use plan. Outside of that area, wilderness values would be subject to possible disturbance from proposed livestock developments and possible mineral development.
Energy and Mineral Development	Development precluded on 21,000 acres including 21,000 acres with moderate potential for oil and gas, and 328 acres with moderate potential for diatomite.	Development precluded on 19,990, plus an additional 2,905 acres, if acquired. Includes 19,990 acres with moderate potential for oil and gas, and 328 acres with moderate potential for diatomite.	No impact.
Vegetation	Vegetation preserved.	Vegetation preserved in suitable area. Vegetation diversity reduced on 1,010 acres of sagebrush control.	Vegetation diversity reduced on 1,010 acres of sagebrush control. No impact elsewhere.
Wildlife	Wildlife habitat preserved.	Wildlife habitat preserved in suitable area. Livestock improvements may benefit antelope and adversely affect deer.	Livestock improvements may benefit antelope but adversely affect deer.
Livestock Grazing	Opportunity to provide better management and additional forage by brush control would be foregone. A possible increase of up to 205 AUMs would also be foregone.	Proposed brush control allowed, providing additional forage. Up to 205 AUMs of additional licensed use could be realized.	Same as partial.
Recreation Use	Primitive recreation values maintained or improved. Restriction of motor vehicles to roads would result in net reduction in overall recreation use. No significant impact.	Same as all wilderness, except vehicle-oriented recreation eliminated. Primitive recreation would not offset loss of vehicle-oriented recreation.	Existing motorized uses of area would continue. Primitive recreation would be disturbed by other activities. No significant impact.
Economic Value and Local Income	Decrease in economic value and local personal income by $2,963 and $878, respectively, essentially all from loss of oil and gas leases. The maximum increase in transportation costs to ranchers with grazing permits would be $48.	Decrease in economic value by $1,804 and increase in local personal income by $960. The maximum increase in transportation costs to ranchers with grazing permits would be $48.	Increase in economic value and local personal income by $734 and $1,710.

Most of the reservoirs are small and screened by vegetation or topography, so they only slightly influence the area. However, two of the reservoirs are the most noticeable developments within the WSA. The northern-most reservoir in the WSA is noticeable because of the surrounding open, flat country. The reservoir at the south end of Burnt Flat is visible from a large area because of the high ridge and peak to the southeast, and its location in a flat area. In addition to the 12 reservoirs in the WSA, there are also 4 reservoirs on private inholdings.

The two fences cross the western portion of the WSA. Both fences enter from the west boundary and end at the top of the high ridge. One fence is immediately west of Stonehouse Peak. The other one enters the study area from private property and moves southeast to a high point. These have only minor visual influences due to topographic and vegetative screening.

The 13 vehicle ways are substantially unnoticeable due to the fact that they are overgrown with sagebrush. Four ways end at the east rim of the WSA and are less than 1 mile long. Two of the ways go to springs, while six of the ways lead to reservoirs and one to a private inholding.

Outside sights and sounds have a very minor effect on the study area. Sources of outside sights are the boundary roads, four reservoirs, a cabin and, from high points, the county road and ranches to the east. These features do not detract from the wilderness character of the study area.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The Stonehouse WSA has outstanding opportunities for solitude. The configuration of the WSA may constrain movement within the study area. This should not substantially affect the opportunities for solitude except in the northern end of the WSA, and visitor use will probably be low in that area.

Topographic screening is provided by the Steens Mountain ridgeline which bisects the WSA. The west side of the area is screened from the east side by the ridgetop peaks. Small areas within the center of the study area are screened by broken ridges and rolling hills. Shallow drainages throughout the WSA also enhance the opportunity for solitude.

Vegetative screening also enhances opportunities for solitude within the WSA. Juniper is scattered throughout the study area and aspen occurs in small clusters in the north end creating places for solitude. The steep, east slopes of the Steens ridge have dense juniper stands, but the steepness of this area would make it extremely difficult for most visitors to use the area.

The WSA provides outstanding opportunities for primitive forms of recreation. These activities include day hiking, backpacking, camping, hunting, and sightseeing.

Opportunities for day hiking within the Stonehouse WSA are very good. The major attraction would be the main ridge which overlooks Juniper, Tudor and Fifteen Cent Lakes outside the study area to the east. Short loop hikes are possible by hiking along the main east-face rim and returning by other drainages, or by traversing the various west slopes. The steep east face would be a very challenging hike.

These features would also be of interest to the backpacker or camper. Stonehouse WSA provides an opportunity for 3- to 4-day trips. Adequate campsites are available and water is found throughout the WSA, but is not abundant.

Game species which can be hunted within the WSA include mule deer, antelope and chukars. Opportunities for hunting are excellent throughout the WSA.

Opportunities for sightseeing are also good within the WSA. The east rim of the Steens provides spectacular views of the surrounding area including the Alvord Basin and Sheepshead Mountains. The rocky cliff faces, the steep east-facing escarpment, and the shallow lakes within the central portion of the area provide good opportunities for sightseeing within the WSA.

Special Features

A special wilderness feature of the Stonehouse WSA is the escarpment's outstanding scenic quality. The escarpment is highly visible and has a variety of landform, color, and vegetation. The escarpment is one of a series of steep fault scarps which formed the basin and range topography of much of southeastern Oregon.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the study area is in the Intermountain Sagebrush Province. The potential natural vegetation is sagebrush steppe and alpine meadows and barren communities.

Nine ecosystems listed in the Basin and Range section of the Oregon Natural Heritage Plan occur in this study area. The tree communities are western juniper/big sagebrush/bluebunch wheatgrass, western juniper/bluebunch wheatgrass, and aspen groves. The sagebrush communities are big sagebrush/bluebunch wheatgrass, big sagebrush/Idaho fescue, low sagebrush/bluebunch wheatgrass, low sagebrush/Idaho fescue, low sagebrush/Sandberg's bluegrass, and silver sage community.

The study area is within 5 hours' driving time of one standard metropolitan statistical area with population over 100,000: Boise, Idaho.

Energy and Mineral Development

The geology, energy, and mineral resources of the Stonehouse WSA were evaluated by interpreting existing literature, reviewing mining and mineral leasing records, and correlating rock units in the WSA with similar environments in other areas that are known to contain mineral deposits. Technical details of the findings of the evaluation are in a report titled "Sheepshead Mountain Geologic Resource Area (GRA OR-023-18), Harney and Malheur Counties, Oregon," prepared by TERRADATA, a consulting firm under contract with BLM, and in a BLM report on the assessment of mineral resources in the South Harney GRA.

The WSA is within the geologic resource areas which have been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The eastern border of the WSA has moderate favorability for the occurrence of diatomite. The environment necessary for the accumulation of diatomite is found in tuffaceous lake sediments which are present in the WSA. These sediments are similar to units found in other Tertiary basins in southeastern Oregon that are known to contain diatomite.

The entire WSA is rated moderate for the occurrence for oil and gas.

Table 3 shows the mineral potential classifications for the WSA. Map 4 shows the portion of the WSA rated moderate (medium) for diatomite.

**Table 3. Classification of Energy and Mineral Potential,
Stonehouse WSA (OR-2-23L)**

Commodity	Area	Classification Level	Confidence Level
Metals (mercury)	Entire WSA	2	B
Geothermal	Entire WSA	1	B
Uranium/Thorium	Entire WSA	1	A
Coal	Entire WSA	2	C
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	B
Bentonite	Entire WSA	2	A
Diatomite	See map 4	3	A
	Rest of WSA	1	B
Zeolites	Entire WSA	2	A
Sodium	Entire WSA	2	A

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

Aside from abundant road aggregate sources, there are no known occurrences of mineral deposits within the WSA. As of January 1, 1984 there were two oil and gas leases covering 2,915 acres within the WSA. There were no geothermal leases or mining claims in the WSA as of January 1, 1984.

The surface rocks of the WSA are composed mainly of Steens Basalt which consists of numerous thin flows of olivine basalt and rare interlayers of tuffs, with a cumulative thickness of several thousand feet. Locally, the area is overlain with semiconsolidated lacustrine (lake) tuffaceous sediments, ash flow tuffs, and sedimentary rocks.

Vegetation

There are five major vegetation types in the WSA. The most widespread is the low sagebrush/bunchgrass type. Other communities include mountain big sagebrush/bunchgrass, juniper/bunchgrass, wet meadows and riparian areas, and silver sagebrush.

The low sagebrush/bunchgrass type is found on shallow soil where the topography is flat or gently rolling. The estimated successional stage is late seral and the climax vegetation is low sagebrush and Idaho fescue. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.)

The mountain big sagebrush/bunchgrass community occurs on deep well-drained soils. These occur primarily in narrow strips along north slopes. The estimated successional stage is mid-seral. The major climax species are Idaho fescue, needlegrasses, and mountain big sagebrush.

The western juniper/bunchgrass type is scattered throughout the study area, becoming thickest on the east face of the Steens and along the sides of drainages. The primary understory grass is bluebunch wheatgrass. Idaho fescue occurs on the more moist sites. Other grasses occurring include Thurber's needlegrass, bottlebrush squirreltail, and Sandberg's bluegrass. In some higher areas, there is mountain mahogany mixed in with the junipers. Big sagebrush and rabbitbrush are also common. The estimated successional stage is late seral. The primary climax species is bluebunch wheatgrass. Western juniper and big sagebrush will also be present in the climax community.

There are several areas of wet meadow that occur along the streams and around springs. The vegetation present consists of rushes, sedges, perennial forbs, and Kentucky and Nevada bluegrasses. There are also small and scattered aspen stands. The aspens have bluegrasses, mountain brome, and snowberry in the understory. The estimated successional stage of both areas is mid-seral. Climax vegetation on the meadows is primarily Nevada bluegrass and sedges. Aspen and snowberry are the primary climax species in the aspen groves.

The vegetation community on Burnt Flat is silver sagebrush. This area is seasonally flooded. The estimated successional stage is mid-seral. The primary climax species are silver sagebrush, creeping wildrye, and mat muhly.

Another big sagebrush community exists on the eastern edge of the WSA. This is a big sagebrush/bluebunch wheatgrass community which is now part of a rehabilitation seeding. The successional stage is estimated to be early seral, and the climax community contains bluebunch wheatgrass, big sagebrush and some bitterbrush.

Wildlife

Water is well distributed throughout the WSA in years with normal or above-normal precipitation. However, in years with below-normal precipitation many of these water sources do not provide water for wildlife throughout the summer.

Mule deer and antelope use the higher elevations of the WSA during the summer. The lower elevations of the WSA provide winter habitat for mule deer and antelope from within and outside of the WSA.

The steep slopes on the east side of this WSA provide excellent habitat for chukar, and populations in these areas are high. Sage grouse are abundant in the higher elevations of the WSA where big sagebrush and low sagebrush cover occurs.

Golden eagle, common raven, American kestrel, prairie falcon, and great horned owl are common raptor species.

Nongame wildlife species include coyotes, mountain cottontail, common flicker, Say's phoebe, western meadowlark and the sagebrush lizard.

Livestock Grazing

Portions of 3 grazing allotments are within the WSA. Table 4 summarizes existing and potential livestock use in AUMs (animal unit month, the amount of forage required by one cow and calf or equivalent animals, for one month).

Existing livestock developments (among the man-made features listed in the Naturalness section) include 2 reservoirs, 2 ditches, and 1 mile of fence.

A project involving 1,010 acres of sagebrush control to improve livestock forage and provide better management is proposed on an area in the Pollock allotment. This would increase forage production in the WSA and could result in a possible increase in livestock use of up to 205 AUMs in the allotment.

Grazing operators use motor vehicles for access within and around the WSA. The dead-end road and ways within the WSA are used frequently for salting, livestock supervision, and for access to a private inholding owned by one of the operators who pastures cows there during the summer.

Table 4. Existing and Potential Livestock Use, Stonehouse WSA (OR -2-23L)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs) [1]
Burnt Flat (No. 5313)	4,568	07/01 to 10/31	36	1,645	0
Alvord (No. 6012)	8,803	07/01 to 09/30	0.5	185	0
Pollock (No. 6011)	4,760	04/01 to 09/30	8	450	205
Totals	18,131			2,280	205

[1] Increase might or might not result in increased licensed use in the allotment (see narrative).

Recreation Use

Recreation use in the Stonehouse WSA is primarily hunting. Mule deer, antelope, and chukar are the most commonly hunted game species. It is estimated that mule deer hunting accounts for moderate visitor use while antelope hunters account for low visitor use.

The roads and ways are both used by hunters, and vehicles are the primary means of access into the area.

Chukar hunters account for moderate visitor use. Chukar hunters also use vehicles to gain access to their hunting areas but many also park their vehicles along the county road and hike to their destination on the eastern side of the WSA along the base of the ridgeline.

At this time the study area receives little primitive recreation use not associated with hunting.

Economic Value and Local Income

Livestock grazing, oil and gas leases, and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were 2 oil and gas leases and no geothermal leases on the WSA.

Economic value and local personal income generated from existing levels of resource outputs of these lands are presented in table 5. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 21,000 acres to the National Wilderness Preservation System (NWPS), including the steep east-facing escarpment of the Steens Mountain fault block and the sagebrush covered hills and flats and intermittent lakes in the remainder of the WSA.

Wilderness designation under this alternative would maintain or improve the natural qualities of the area as well as the outstanding opportunities for solitude and primitive types of recreation. Closure of 14 miles of vehicle ways would improve the naturalness of the area by eliminating most vehicle use and allowing the ways to revegetate. Closing the vehicle ways would also improve the opportunities for solitude and the quality of primitive recreation.

The scenic values of the area would be maintained by precluding major developments within the study area. Precluding potential mineral development and proposed livestock improvement projects would also

Table 5. Economic Value and Local Personal Income Generated Annually, Existing Program, Stonehouse WSA (OR-2-23L) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	2,280	$17,191	$19,015
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil and Gas Leases	Acres	2,915	2,915	878
Total	$		20,106	19,893

maintain existing wilderness values throughout the area.

The **partial alternative** would add 22,895 acres to the NWPS, assuming the 2,905 acres of private and split-estate lands could be acquired. Most of the wilderness values, including naturalness, solitude and recreational opportunities and the scenic values of the WSA, are in the portion of the WSA recommended suitable and would be protected under this alternative. Opportunities for solitude and primitive recreation would be preserved, and they would be enhanced if the recommended acquisitions occurred.

Closure of the 1 1/2 mile dead-end road and 13 miles of ways would enhance the area's naturalness and opportunities for solitude and primitive recreation.

The remainder of the study area (1,010 acres) recommended nonsuitable contains few wilderness values. However, the natural character of this portion of the area would be adversely affected from the proposed brush control project. Other surface disturbing activities, such as energy exploration or development, would be allowed in the nonsuitable portion and could further adversely affect the natural character of the area.

Under the **no wilderness/no action alternative**, the wilderness values and special features of the WSA would be subject to disturbance from resource uses and activities not compatible with wilderness (except in the 6,500-acre area where development would be precluded according to the current land use plan). Any developments within the WSA could have adverse effects on the area's wilderness characteristics. These adverse effects could be greater than those identified under the partial alternative.

Under the no wilderness/no action alternative, the natural character of the WSA could be adversely affected by the proposed brush control project. Naturalness and opportunities for solitude and primitive recreation would be affected by any mineral development, particularly on the east-facing escarpment. These wilderness values would also be adversely affected by any additional vehicle access and use for new developments.

The area's special wilderness features would not be protected from development. Any development on the east-facing escarpment would have adverse effects on the outstanding scenic values.

Effects on Energy and Mineral Development

Areas designated as wilderness would be withdrawn from mineral exploration and development: 21,000 acres under the **all wilderness alternative**, and 19,990 acres, plus an additional 2,905 acres if private and split-estate land is acquired as proposed, under the **partial alternative**. These withdrawals would include the area rated moderately favorable for oil and gas, which encompasses the entire WSA. The portion rated moderately favorable for diatomite, 328 acres, would be included in the withdrawals under both the all wilderness and partial alternatives.

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Vegetation

Areas designated wilderness would not be subject to most surface disturbing activities. Vegetation dependent upon the existing undeveloped environment would thus be maintained.

Under the **partial and no wilderness/no action alternatives**, sagebrush control on 1,010 acres would temporarily reduce vegetative diversity by reducing brush and allowing grass species to increase in density and thus change the vegetative composition.

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness.

Under the **partial and no wilderness/no action alternatives**, proposed livestock improvements (sagebrush control) may benefit some wildlife species (such as antelope) by improving their habitat and may slightly increase their numbers. Antelope prefer areas of herbaceous vegetation. The portion of the proposed brush control above the 4,300-foot elevation (approximately one-third of the project area) may adversely affect deer winter range by reducing winter forage.

Effects on Livestock Grazing

Under the **all wilderness alternative**, the proposed brush control of 1,010 acres and change in management would be precluded, and an opportunity to increase forage production and improve management in the WSA would be foregone. Possible increases in livestock use of up to 205 AUMs would also be foregone.

The proposed brush control project has a benefit/cost ratio greater than 1:1.

Closing the ways could inconvenience the livestock operator, as motor vehicle use to manage livestock would be confined to the dead-end road.

Under the **partial alternative**, the brush control would be implemented as proposed resulting in the production of additional forage for better management of livestock and wildlife. The dead-end road and ways would be closed, making it inconvenient for the livestock operator to distribute salt and supervise livestock.

Under the **no wilderness/no action alternative**, there would be no restrictions on livestock management. The proposed brush control would be permitted and vehicle use could continue.

Under both the partial and no wilderness/no action alternatives, the forage produced from the proposed brush control (up to 205 AUMs) may be licensed if it is sustainable and all forage needs in the allotment have been considered.

Effects on Recreation Use

The quality of and opportunities for primitive types of recreation would be maintained at their present level or improved under the **all wilderness alternative**. Elimination of vehicle use on ways throughout the WSA would improve the quality of primitive recreation.

This alternative would generally reduce vehicle-oriented recreation use. Hunting for deer and antelope would be most affected. The reduction in hunter-visitor days would probably be substantial, as the area receives heavy hunting use associated with motor vehicles.

This does not mean that hunting in the area would be eliminated. Some of the reduction in visitor days from vehicle-oriented hunting could be offset by increased use from hunters who do not use vehicles for transportation within their hunting area.

This alternative would maintain the existing upland game bird hunting use, because the majority of the hunting occurs along the east face of the escarpment, and hunters hike to where they hunt.

The **partial alternative** would also maintain or improve the quality of primitive recreation in the area recommended suitable. Closing the dead-end road in addition to the ways would further reduce the impact of vehicle use on primitive recreation.

Because of vehicle restrictions in both the all wilderness and partial alternatives, it is expected that overall recreational use of the WSA would decline. Existing use of the area for primitive recreation is thought to be limited, and for that reason it is not expected to significantly increase under these alternatives. Any expected increase in primitive recreation use would not be sufficient to offset expected reductions in vehicle-oriented recreation. The effects under the all wilderness and partial alternatives would be similar.

Under the **no wilderness/no action alternative**, primitive recreation would be subject to continued disturbances by existing vehicle access routes and use (except in the 6,500-acre area closed to development and vehicle use under the current land use plan). Primitive recreation activities would be further disturbed by proposed range improvements and possible mineral development. Overall recreation use would not be significantly affected.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 6 and 7. Table 6 shows the

Table 6. Effects of Alternatives on Annual Economic Value Stonehouse WSA (OR -2-23L) (1981 price levels

Item	Unit of Measure	All Wilderness	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0	+205	+205
Oil and Gas Leases	Acres	-2,915	-2,490	0
VALUE OF PLANNED INVESTMENTS [2]				
Grazing	$	0	+1,546	+1,546
Investments [3]	$	0	-812	-812
Net Economic Value	$	0	+734	+734
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Reduced Access [4]	$	-48	-48	0
Oil and Gas Leases	$	-2,915	-2,490	0
Total	$	-2,963	-2,538	
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	-2,963	-1,804	+734

[1] Expected future increases due to range improvement investments.

[2] A vegetative manipulation project involving up to $10,080 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[4] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 7. Effects of Alternatives on Local Personal Income, Stonehouse WSA (OR-2-23L) (1981 price levels)

Item	Unit of Measure	All Wilderness	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0	+205	+205
Oil and Gas Leases	Acres	-2,915	-2,490	0
INCOME FROM PROPOSED INVESTMENTS [2]				
Grazing	$	0	+1,710	+1,710
Construction activity [3]	$	0	+6,772	+6,772
Total [4]	$	0	+1,710	+1,710
INCOME FROM OTHER EXPECTED OUTPUT CHANGES				
Oil and Gas leases	$	-878	-750	0
INCOME FROM ALL OUTPUT CHANGES				
All Categories	$	-878	+960	+1,710

[1] Expected future increases due to range improvement investments.

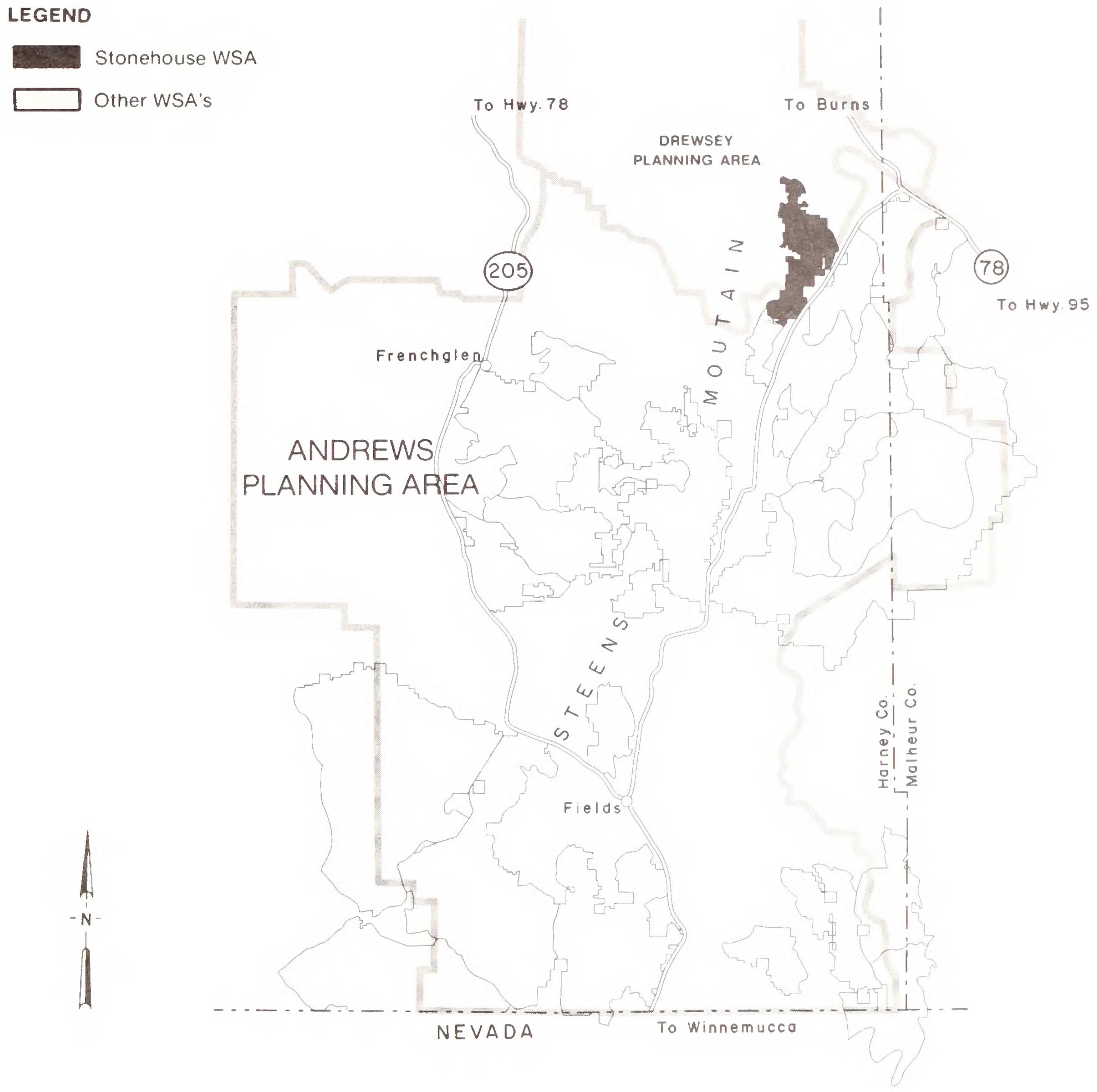
[2] A vegetative manipulation project involving up to $10,080 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[4] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 3.

effects on economic value and table 7, the effects on local personal income. Vegetative manipulation projects, such as the proposed sagebrush control project, would not be allowed in wilderness.

Currently, there is little dependence on vehicles for livestock management in the study area. The wilderness alternatives would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $48 per year.



U. S. Department of the Interior
Bureau of Land Management

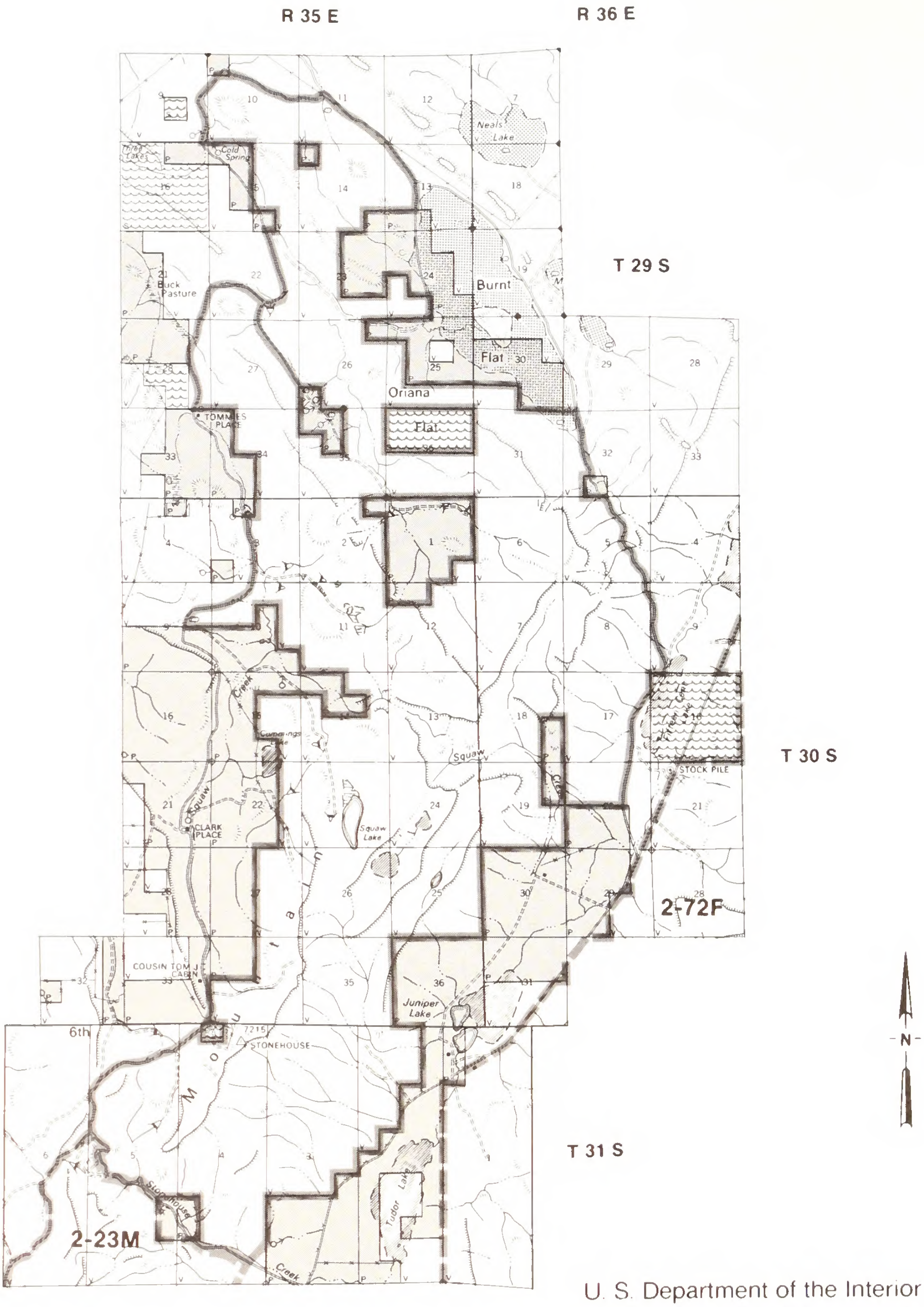
Burns District

Stonehouse WSA
OR-2-23L

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

- - Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

▨ Private

≋ BLM Surface-State or Private Subsurface (Split Estate)

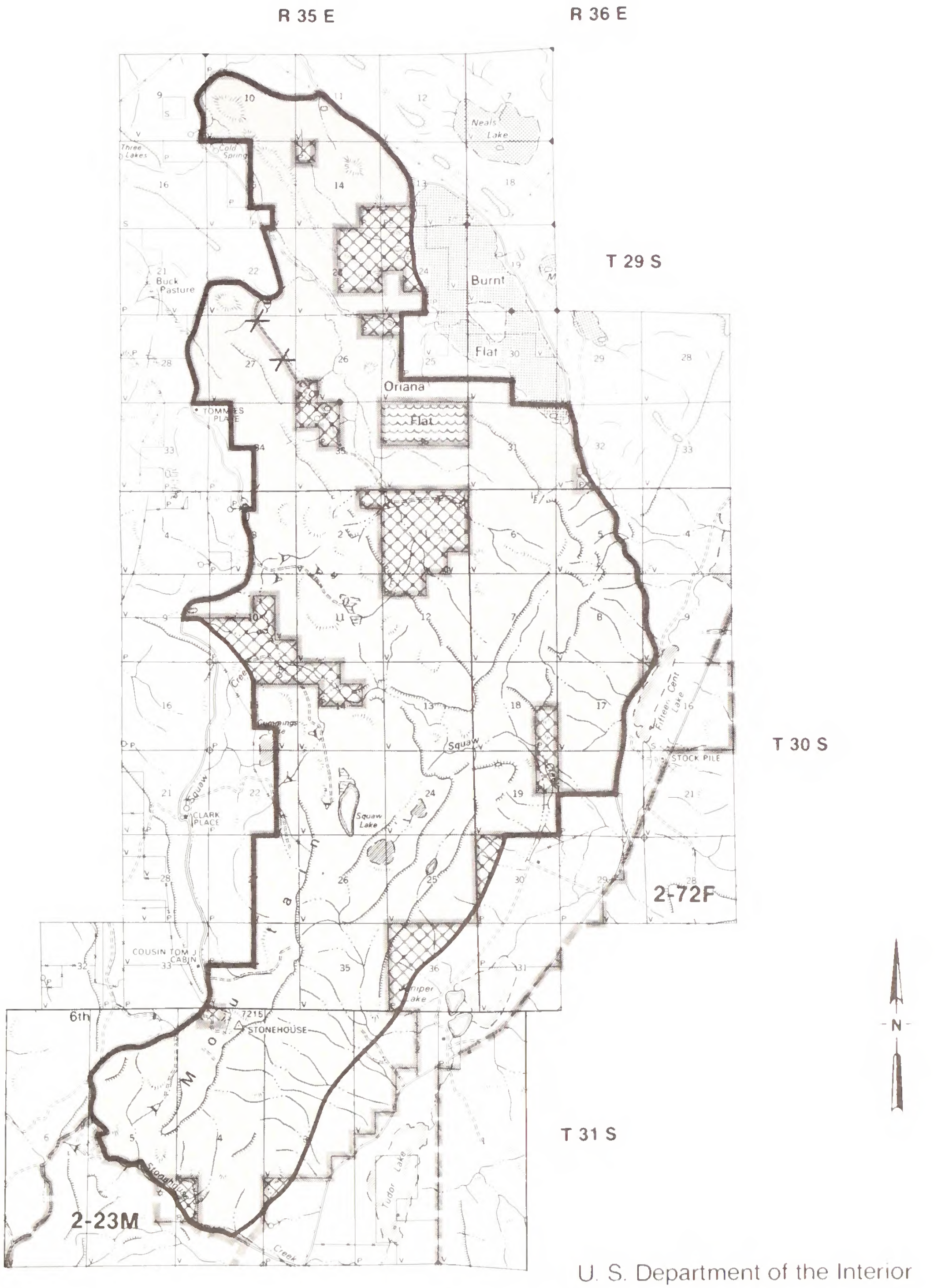
U. S. Department of the Interior
Bureau of Land Management
Burns District

Stonehouse WSA
OR-2-23L

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

— Wilderness Study Area Boundary

- - Boundary of Adjacent Wilderness Study Areas

☐ Recommended Suitable for Wilderness

☐ Recommended Non-suitable for Wilderness

▨ Non-Federal Land within Recommended Wilderness

▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

✕✕ Recommended Road Closure

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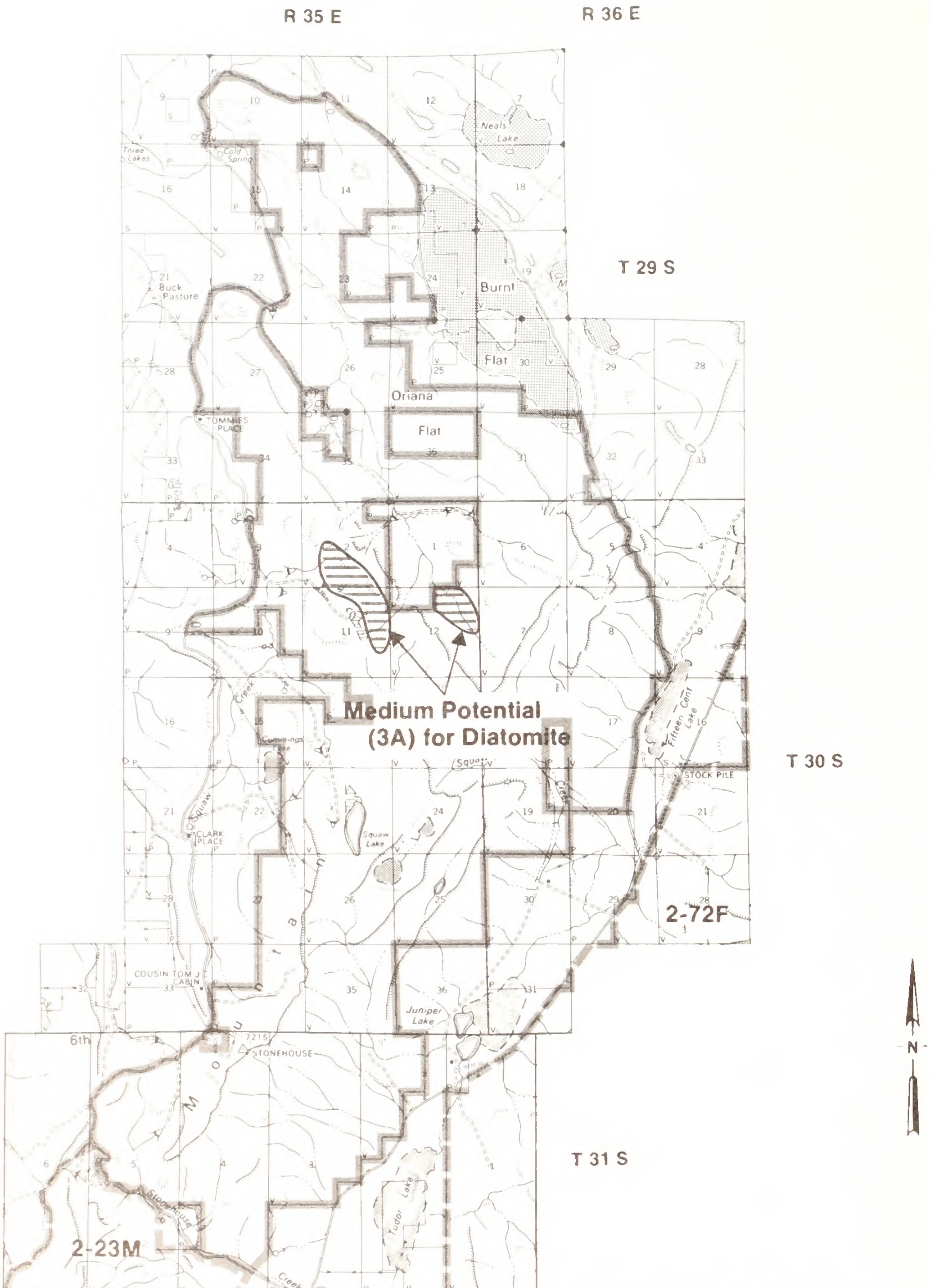
Stonehouse WSA
OR-2-23L

PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 3



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Bureau of Land Management
Burns District

Stonehouse WSA
OR-2-23L

Entire WSA:
Medium Potential
(3B) for Oil and Gas

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4

Stonehouse WSA, OR-2-23L. Plateau country just west of the ridgeline looking west across Oriana Flat (the juniper covered basin in the middle of the picture). This area is recommended suitable under the partial alternative and nonsuitable under the preferred (no wilderness/no action) alternative. August 1983.

Stonehouse WSA, OR-2-23L. Looking south along the Steens ridgeline on the eastern side of the WSA. The canyon in the middle of the picture is Squaw Creek. From this point, part of the West Peak (OR-2-72J) and Table Mountain (OR-2-72I) WSAs are visible in the distance on the left, while the High Steens WSA (OR-2-85F) is visible in the distance to the right of center. Within area recommended suitable under the partial alternative and nonsuitable under the preferred (no wilderness/no action) alternative. August 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Lower Stonehouse Wilderness Study Area (OR-2-23M)

General Description of the Study Area

The Lower Stonehouse wilderness study area (WSA) is located about 60 miles southeast of Burns in Harney County and 16 miles south of State Highway 78, along the county road which runs from the state highway near Folly Farm to Fields (see map 1).

The study area contains 8,090 acres of public land in a somewhat rectangular shape, 6 miles long and 2 1/2 miles wide (see map 2). In addition, there is a 160-acre parcel of private land in the southern half of the WSA.

Private land forms part of the study area's boundary on all sides. A parcel of split-estate land (federally managed surface, state or privately owned subsurface mineral rights) lies adjacent to the area on the southwest. Roads form most of the remainder of the boundaries except along the eastern side where a portion of the eastern boundary follows the edge of two crested wheatgrass seedings.)

The Lower Stonehouse WSA is located along the northern portion of the Steens Mountain fault block. The topography of this area is similar to those of other study areas which are along the eastern face of the mountain. The WSA includes a portion of the steep east-facing Steens escarpment as well as gentle westerly sloping areas. The Steens ridgeline, rising an average of 2,000 feet, is the dominant topographic feature as it runs lengthwise through the center of the area.

The highest points in the study area occur in two locations along the ridge where two high points on the ridgeline reach an elevation of over 7,300 feet. One of these peaks, the highest point in the WSA at 7,352 feet, is just within the study area along the western boundary. The lowest elevation in the WSA, 4,280 feet, occurs along the southeastern boundary.

West of the ridgeline, the topography is gentle, with broad, rolling open terrain. However, this part of the WSA is less than a quarter of the study area's total size.

Many spring-fed intermittent streams flow to the southeast from the top of the ridge down the face toward the eastern boundary. Stonehouse Creek, one of the more prominent drainages, is in the northern portion of the study area.

The vegetation in the area includes western juniper, mountain mahogany, aspen, big and low sagebrush, and a variety of grasses and forbs. Juniper is the major tree species and it occurs on the eastern slope of the ridge and along the sides of the drainages. In the higher elevations, mountain mahogany is commonly associated with the juniper and occasionally occurs in small dense clusters. Scattered groves of aspen are found in the northwestern portion of the study area.

Interrelationships

Adjacent to the northern boundary of the study area is the Stonehouse WSA (OR-2-23L). It is separated from the Lower Stonehouse area by a BLM/private road and a small amount of private land. The road is maintained by BLM and private landowners on an as-needed basis and is used by BLM, landowners, and recreationists for access to the northern portion of Steens Mountain.

The Oregon Department of Fish and Wildlife (ODFW) conducts an aerial census twice a year on the area's deer and antelope populations. For comparison, a census is also taken via horseback in the study area.

The U.S. Fish and Wildlife Service conducts predator control program to reduce damage to livestock by aerially shooting coyotes.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. The only issue raised for this WSA was the possibility of closing the boundary road and combining the Lower Stonehouse WSA with the Stonehouse WSA to the north to form one wilderness area.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- partial
- no wilderness/no action (preferred alternative)

An enhanced wilderness alternative recommending closure of the northern boundary road and combining the Lower Stonehouse WSA with the Stonehouse WSA is not analyzed because of the importance of the boundary road. The Stonehouse road provides the primary access to the upper elevations of the northern portion of Steens Mountain from the eastern side of the mountain. In addition to the use it receives from ranchers and BLM personnel, the road is heavily used by deer hunters in the fall.

An enhanced wilderness alternative which recommends acquisition of the private inholdings or any of the adjacent land also is not analyzed because it would not be substantially different from the partial alternative.

All Wilderness

The all wilderness alternative would recommend all 8,090 acres of the WSA suitable for wilderness designation (see map 1). For purposes of analysis, it is assumed the private inholding would not be acquired.

Partial

The partial alternative would recommend 7,125 acres suitable for wilderness and 965 acres nonsuitable (see map 3). An attempt would be made to acquire the 160-acre inholding in the southern portion of the WSA as well as parcels of split-estate and private land which form part of the boundary. The acquisitions along the boundary would include 200 acres of private land and 250 acres of split-estate land. These 610 acres of private and split-estate land could be acquired through purchase or exchange with willing landowners.

Assuming acquisition of these parcels, total area recommended suitable under this alternative would be 7,735 acres.

The boundary would be adjusted on all sides of the study area. In the north, the boundary would be moved to the northern boundary road. The adjustment on the west would pull the boundary westward away from the edge of the ridgeline where visitor use (and management problems) would be likely to occur.

Management problems resulting from poorly identified boundaries could still occur in the southwestern portion of the WSA, but would be improved through this alternative. On the north and west, acquisition of private land would be acquired to improve the manageability of the boundary.

On the south, the boundary would be located along a ridgeline instead of along a legal subdivision, improving boundary identification.

The portion recommended as nonsuitable is along the southeastern side of the WSA. The boundary would follow the 4,600-foot elevation level. This would avoid conflict with a proposed range improvement, involving brush control on 780 acres of an old crested wheatgrass seeding.

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- implementation of proposed livestock improvements, including a fence and brush control within an old crested wheatgrass seeding,
- continued availability for mineral exploration and development, and
- continued use of motor vehicles by livestock operators and for recreational purposes.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The area would be manageable as wilderness under both the all wilderness and partial alternatives. However, the area might be difficult to manage under the all wilderness alternative because of the WSA's relatively small size and its configuration. The study area is primarily a very steep ridge with only a small amount of land on either side available for recreation or other uses. In addition, the study area is bounded by parcels of private land on all sides. This boundary is not readily identifiable and in places, particularly along the western side, it cuts into the WSA far enough to preclude easy access along the top of the ridgeline.

Under the partial alternative, the manageability of the area would be improved somewhat with the acquisition of a 160-acre inholding and private and split-estate lands on the boundary. This would improve access along the ridgeline. However, management problems could still occur on the east and west as a result of poorly defined boundaries with adjacent private land. Some of these problems could be reduced with signing or fencing.

Table 1. Summary of Proposed Mangement Under Each Alternative, Lower Stonehouse WSA (OR-2-23M)

Proposed Management	All Wilderness	Partial	No Wilderness/ No Action
Acres Designated as Wilderness	8,090	7,125	0
Acres Closed to ORVs by Wilderness Designation	8,090	7,125	0
Miles of Ways Closed	1.5	0	0
Acres of Full Fee Estate Acquired [1]	0	360	0
Acres of Split Estate Acquired [1]	0	250	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	8,090	7,125	0
Structural Livestock Projects Developed: Fences (miles)	0-2	0-2	2
Vegetative Manipulation for Livestock: Brush Control Withouth Seeding (acres)	0	780	780

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

Rationale for Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because the benefits to be gained from keeping the area open to potential resource development and the use of motor vehicles outweigh the benefit of preserving its wilderness values. It is also preferred because of potential manageability problems. Two range improvement projects are proposed in the area and vehicles are used for recreation (primarily hunting).

Potential manageability problems could arise in both the all and partial alternatives. Because of poorly defined boundaries with private lands, recreation use could be difficult to manage. Adding to the boundary problem is the area's small size.

Table 2. Summary of Environmental Consequences of Alternatives, Lower Stonehouse WSA (OR-2-23M)

Resource or Activity	Partial	All Wilderness	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 7,735 acres to NWPS, assuming acquisition of 610 acres of private and split-estate land. Includes all features identified in all wilderness alternative. Improves manageability by acquisition of adjoining private lands to reduce conflicts and create more readily identifiable boundaries. The area recommended as nonsuitable would be open to the development of proposed range improvements as well as energy and mineral development. Both types of development would reduce the area's wilderness values.	Would add 8,090 acres to NWPS, and preserve wilderness values and special features, including a portion of the Steens Mountain fault block escarpment and its associated scenic qualities. Closure of 1 1/2 miles of way would improve naturalness of the area. The area would be manageable as wilderness, but management could be difficult due to the area's small size, its configuration, the large amount of adjacent private land, and boundaries which are not readily identifiable.	Wilderness values and special features would be subject to possible disturbance from development of proposed range improvements and mineral resources.
Energy and Mineral Development	Development precluded on 7,125 acres, plus an additional 610 acres if acquired. Includes 7,125 acres with moderate potential for oil and gas and none of the area with moderate potential for diatomite.	Development precluded on 8,090 acres, including 8,090 acres with moderate potential for oil and gas, and 325 acres with moderate potential for diatomite.	No impact.
Vegetation	Vegetation preserved in suitable area. In nonsuitable area, vegetation diversity reduced on 780 acres of sagebrush control; federal candidate species, and ONHP species if designated BLM sensitive, would be protected.	Vegetation preserved.	Same as nonsuitable under partial.
Wildlife	Wildlife habitat preserved in suitable area. In nonsuitable portion, proposed brush control for livestock grazing would marginally benefit antelope and adversely affect deer winter range.	Wildlife habitat preserved.	Same as nonsuitable under partial.
Livestock Grazing	Proposed brush control allowed increasing forage production. A possible increase of up to 150 AUMs of licensed forage could be realized. Proposed fence might not be allowed, possibly foregoing a licensed forage increase of up to 250 AUMs.	Opportunity to provide up to an additional 150 AUMs by brush control would be foregone. Proposed fence might not be allowed, possibly foregoing opportunities to improve management and to increase licensed use by 250 AUMs.	Proposed fence and brush control allowed, and increase of 400 AUMs realized in the WSA.
Recreation Use	Same as all wilderness alternative, except way would not be closed. Overall reductions would likely be lower than under all wilderness.	Primitive recreation improved by vehicle restrictions. Restrictions would affect hunting, which is primarily vehicle-oriented. Slight reduction in overall recreation use, but no signifcant impact.	No significant impact. Existing vehicle-oriented uses would continue. Primitive recreation would be subordinate to other activities.
Economic Value and Local Income	Decrease in economic value by $2,852 and increase in local personal income by $224 if proposed fence is not allowed. Decrease in economic value by $1,345 and increase in local personal income by $2,309 if proposed fence is allowed. The maximum increase in transportation costs to ranchers with grazing permits would be $5.	Decrease in economic value and local personal income by $4,042, and $1,216, respectively, if proposed fence is not allowed. Decrease in economic value by $2,536 and increase in local personal income by $869 if proposed fence is allowed. The maximum increase in transportation costs to ranchers wih grazing permits would be $5.	Increase in economic value and local personal income by $2,072 and $3,336 respectively, from proposed projects.

Affected Environment

This section discusses only those activities or resources which influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Lower Stonehouse WSA is in a relatively natural condition. The WSA contains six man-made features: 3 reservoirs, a fence 1 1/4 miles long, a way (a vehicle route established and maintained solely by the passage of motor vehicles) totaling 1 1/2 miles, and a crested wheatgrass seeding. These man-made features influence about 4 percent of the study area. (The area of influence is an estimate of the acreage in the WSA from which these man-made features can be seen).

Two of the reservoirs, near the western boundary road, are small. These reservoirs are difficult to detect and there is no vehicular access to them. The third reservoir lies in the northwest corner at the head of a drainage. It is substantially unnoticeable due to the topography and trees in the vicinity.

The fence runs from the eastern boundary, due west, up the lower east slopes of the Steens face. It is basically unnoticeable. The vehicle way closely parallels the southeast boundary road and is generally unnoticeable.

The seeding is in the southwest corner of the study area and is barely visible. It was seeded in 1965 as a result of a burn. The lower slopes were seeded by a drill and the upper slopes were aerially seeded. The average visitor is not likely to notice the seeding from a distance because sagebrush and other species are growing in it. Once inside the seeding, the drill rows are more discernible, but not enough to appear obviously unnatural.

The outside sights and sounds which influence this area are minimal. These include ranching activities from the Mann Lake Ranch and traffic on the county road from Fields to Folly Farm.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude are outstanding. Both topography and vegetation provide screening, but the size of the area would support only a limited number of users. On the whole, about two-thirds of the area has sufficient topographic screening to enhance a visitor's opportunity for solitude. The ridge that makes up the majority of the study area would screen visitors on one side from those on the other.

Areas with the greatest potential for solitude are in the drainages of the east-facing escarpment, as well as a few places on the top of the ridge where shallow drainages and small hills provide enough screening for a small number of visitors. Other portions of the WSA on top of the ridge and in the southeast corner provide insufficient topographic screening to enhance solitude.

Juniper stands on the east face and the northwest ridgetop offer vegetative screening. Juniper also grows in the shallow drainages and wet areas on the western slope. A few aspen groves grow in wet areas in the northwest corner of the study area. This screening enhances solitude in the WSA.

The study area has outstanding opportunities for primitive recreation, but these are limited by the size and topography of the WSA. Hunting, day hiking, backpacking, camping and sightseeing have the best primitive recreation potential.

The opportunities for day hiking are limited, but hikers would be drawn to the top of the ridge where the views are expansive. The longest hike on the rim, from end to end in the study area, would be five miles. However, this hike would cross private land.

Backpacking and camping opportunities are similar to those of hiking. Camping spots are not abundant, but areas are available. Water is available on top of the ridge and on the lower east slopes. There are two springs with a number of intermittent streams on the east slopes.

Game species which can be hunted in the area are upland game birds, mule deer, and antelope. The opportunities are best for hunting deer and chukar partridges. Although both of these opportunities are outstanding, deer hunting is somewhat limited by the size and configuration of the WSA.

Opportunities for sightseeing are best on the top of the ridge, which offers views for many miles in all directions, including other portions of Steens Mountain and the Alvord Desert to the south and the Sheepshead Mountain area to the east. The most attractive feature within the study area itself is the impressive east-facing escarpment.

Special Features

Several features in the WSA which add to the value of the area as wilderness include scenic quality, and botanical and wildlife values.

The east-facing escarpment is highly scenic and combines a variety of landforms, color, and vegetation. It is one of a series of steep fault scarps which formed the basin and range topography of much of southeastern Oregon.

Two plant species of special interest, *Lupinus biddlei* and *Lomatium ravenii*, are found within the WSA. (See the Vegetation section for more information.)

Wildlife values are special wilderness features in this WSA because the lower slopes of the east side are crucial winter range for mule deer. Deer are dependent on the forage and cover in the area.

Diversity in the National Wilderness Preservation System (NWPS)

Lower Stonehouse WSA falls within the Intermountain Sagebrush Province, according to the Bailey-Küchler system for classifying ecosystems. The potential natural vegetation of most of the area is sagebrush steppe. Some of it is alpine meadows and barrens, and a small portion is saltbush-greasewood.

The WSA contains six ecosystems listed in the Basin and Range section of the Oregon Natural Heritage Plan. These are big sagebrush/bluebunch wheatgrass at the lower elevations and western juniper/bluebunch wheatgrass on the steep slopes. At the higher elevations,the ecosystems are big sagebrush/Idaho fescue, low sagebrush/Idaho fescue, aspen groves, and a snowbrush and bittercherry community complex.

The study area is within 5 hours' driving time of one standard metropolitan statistical area with population over 100,000: Boise, Idaho.

Energy and Mineral Development

The geology, energy, and mineral resources of the Lower Stonehouse WSA were evaluated by interpreting existing literature, reviewing mining and mineral leasing records, and correlating rock units in the WSA with similar environments in other areas that are known to contain mineral resources. Technical details of the findings of the evaluation are in a report of the assessment of mineral resources, titled "Sheepshead Mountain Geologic Resource Area (GRA OR-023-18), Harney and Malheur Counties, Oregon," prepared by TERRADATA, a consulting firm under contract with BLM, and in a BLM report on the assessment of mineral resources in the South Harney GRA.

The WSA is within the geologic resource areas which have been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA is rated moderate for oil and gas. There were five oil and gas leases, as of January 1, 1984, covering 4,037 acres within the WSA. There were no geothermal leases and no mining claims as of January 1, 1984.

The eastern border of the WSA has moderate favorability for the occurrence of diatomite in lacustrine tuffaceous beds. These sediments are similar to units found in other Tertiary basins in southeastern Oregon that are known to contain diatomite.

Table 3 shows the mineral potential classifications in the WSA. Map 4 shows the portion of the WSA rated moderate (medium) for diatomite.

Aside from abundant road aggregate sources, there are no known occurrences of mineral deposits within the WSA.

The surface rocks are composed mainly of Steens basalt which consists of numerous thin flows of olivine basalt and rare interlayers of tuffs, with a

Table 3. Classification of Energy and Mineral Potential, Lower Stonehouse WSA (OR-2-23M)

Commodity	Area	Classification Level	Confidence Level
Metals (mercury)	Entire WSA	2	B
Geothermal	Entire WSA	1	B
Uranium/Thorium	Entire WSA	1	A
Coal	Entire WSA	2	C
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	B
Bentonite	Entire WSA	2	A
Diatomite	See Map 4	3	A
	Rest of WSA	1	B
Zeolites	Entire WSA	2	A
Sodium	Entire WSA	2	A

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

cumulative thickness of several thousand feet. Locally, the area is overlain with semi-consolidated lacustrine (lake) tuffaceous sediments and ash flow tuffs.

Vegetation

The most extensive plant community in this WSA is western juniper and bluebunch wheatgrass. It occurs primarily on the steep, east-facing slope of the Steens Mountain and in Stonehouse Creek Canyon. Some of the common associated species include big sagebrush, mountain mahogany, snowberry, serviceberry, snowbrush, bittercherry, and some dense stands of aspen. Common grass species are Sandberg's bluegrass and Thurber's needlegrass. The successional stage is estimated to be late seral. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) The major climax species is bluebunch wheatgrass. Juniper and big sagebrush are also present in the climax community in small amounts.

Low sagebrush dominates a small community on the flat, rocky ridgetops at around 7,000 feet in elevation. The estimated successional state of this community is late seral and the climax vegetation is Idaho fescue, Sandberg's bluegrass, and low sagebrush.

A community dominated by big sagebrush occurs extensively on the plateaus at around 7,000 feet in elevation where the soil is deep. The successional stage is estimated to be mid-seral, and the major species in the climax community are Idaho fescue, western needlegrass and big sagebrush.

Wet meadows and aspen groves are intermingled with the big sagebrush community. The vegetation in the meadows is bluegrasses, sedges, and forbs. The aspen groves have a limited understory of bluegrasses, mountain brome, and shade-tolerant forbs. The estimated successional stage of both areas is mid-seral. The climax vegetation on the meadows is bluegrass and sedges, and in the aspen groves is aspen and the associated shrubs.

Another big sagebrush community exists in the southern end of the WSA. This community is at about 4,200 feet in elevation and is part of a rehabilitation seeding, established in 1972. The successional stage is estimated to be early seral and the major climax species are bluebunch wheatgrass, big sagebrush and a small amount of bitterbrush.

Two plant species of special interest (mentioned in the Special Features section), is known to exist within the WSA: *Lupinus biddlei* (Biddle's lupine), which is a candidate for federal listing as threatened or endangered; and *Lomatium ravenii* (Lassen desert-parsley), which is on List 2 of the Oregon Natural Heritage Plan's 'Rare, Threatened and Endangered Plants of Oregon'.

Wildlife

This WSA contains a wide variety of wildlife species due to the diversity of habitat types. Wildlife species range from those using low elevation big sagebrush to those using aspens. Cliffs, rimrock, and the narrow riparian zones along the streams offer additional special habitat types. Water is well distributed.

Mule deer summer at the upper elevations on Steens Mountain and winter on lower elevations within and out of the WSA. Winter deer use may be heavy in the WSA. Antelope winter along the lower slopes of the Steens. Rocky mountain elk make occasional use of the top of Steens Mountain during the summer and fall.

Nongame wildlife species include coyote, mountain cottontail, common flicker, Say's phoebe, and western meadowlark. Species common to the upper elevations are Belding's ground squirrel, northern pocket gopher, and Lewis' woodpecker. Golden eagles, common raven, American kestrel, prairie falcon, and great horned owls are common raptors.

Steep slopes on the east side of Steens Mountain have excellent chukar populations. Sage grouse are abundant on top of the Steens where big sagebrush and low sagebrush cover occurs.

Riparian areas provide habitat for additional species including yellow warbler, rufous-sided towhee, dipper and wandering garter snake.

Livestock Grazing

The WSA contains portions of three grazing allotments. Table 4 summarizes existing and potential livestock in AUMs (animal unit month, the amount of forage required by one cow and calf, or equivalent animals, for one month).

Existing range developments (among the man-made features discussed in the Naturalness section) include 3 reservoirs, 1 1/4 miles of fence, and a crested wheatgrass seeding.

Livestock improvements proposed within the study area include 2 miles of fence and 780 acres of brush control. These would lead to better management and potential increases in forage production in the WSA. As a result, livestock use in the WSA could increase by up to 400 AUMs.

The roads that form the boundaries of the study area are occasionally used by grazing operators for salting and livestock supervision. Horses are used within the study area to move or gather livestock.

Recreation Use

Existing recreation use in the Lower Stonehouse WSA is primarily oriented toward hunting. Mule deer and upland game are the most commonly hunted game species. Visitor use for deer hunting is moderate and chukar hunting is also moderate. Deer hunting occurs throughout the study area but primarily in the upper elevations. Chukar hunting is mostly confined to the lower slopes and drainages on the eastern side of the WSA.

Antelope hunting occurs to a limited extent in the study area. This is primarily due to the low numbers of antelope which are found within the area.

Hunters use vehicles as access to and within the area.

At this time, the WSA receives little primitive recreation use not associated with hunting. Low visitor use can be attributed to day hiking, backpacking, or general sightseeing and wildlife viewing.

Economic Value and Local Income

Livestock grazing, oil and gas leasing, and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were 5 oil and gas leases or geothermal leases on the WSA.

Economic value and local personal income generated from existing levels of resource outputs of these lands are presented in table 5. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Table 4. Existing and Potential Livestock Use, Lower Stonehouse WSA (OR-2-23M)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs) [1]
Alvord (No. 6012)	8,803	07/01-09/15	1	150	250
Mann Lake (No. 6026)	3,600	04/16-06/15	4	230	150
Pollock (No. 6011)	4,760	06/16-06/30	4	150	0
Totals	17,163			530	400

[1] Increases might or might not result in increased licensed use in the allotment (see narrative).

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 8,090 acres to the National Wilderness Preservation System (NWPS). It would preserve the steep east-facing escarpment which is part of the Steens Mountain fault block, the highest and most scenic fault block mountain range in Oregon.

Wilderness designation would maintain or improve the natural qualities of the area as well as the outstanding opportunities for solitude and primitive forms of recreation. Closure of about 1 1/2 miles of way, which parallels the southeast boundary road, would improve the naturalness of the area by eliminating vehicle use and allowing the way to revegetate. Since the vehicle way parallels a boundary road where vehicle use would continue, solitude would not improve.

Wilderness designation would protect the special wilderness features found within the WSA, including a plant species of special interest, crucial deer winter range, and outstanding scenic quality.

The **partial alternative** would add 7,735 acres to the NWPS, assuming 610 acres of private inholding and adjacent private and split-estate land could be acquired. Most of the wilderness values, including the special wilderness features, in the WSA are in this portion and would be included in the NWPS.

The remaining 965 acres recommended nonsuitable would not receive wilderness protection. This area contains few wilderness values. The naturalness of this portion could be adversely affected by the proposed 780-acre brush control project. Surface disturbing activities such as mining would be allowed and could further affect the natural character.

Table 5. Economic Value and Local Personal Income Generated Annually, Existing Program, Lower Stonehouse WSA (OR-2-23M) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	530	$ 3,996	$ 4,420
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil and Gas Leases	Acres	4,037	4,037	1,216
Total	$		8,033	5,636

Under the **no wilderness/no action alternative**, wilderness values of the entire WSA would be subject to disturbance from competing resource uses and activities. Any developments within the WSA could have adverse effects on the area's wilderness characteristics. Naturalness could be adversely affected by the proposed brush control project. Naturalness and opportunities for solitude and primitive recreation would be adversely affected by any energy or mineral development, particularly on the east facing escarpment, and by any additional developments in this area.

The area's special wilderness features could be adversely affected by development activities. Any development on the east facing escarpment would have adverse effects on the outstanding scenic values. Depending on the location and extent of disturbance, the crucial deer winter range and plant species of special interest could also be affected.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development: 8,090 acres under the **all wilderness alternative** and 7,125 acres, plus an additional 610 acres, if private and split-estate land is acquired as proposed under the **partial alternative**.

Included in the withdrawal under the all wilderness alternative would be 325 acres with moderate favorability for the occurrence of diatomite and 8,090 acres with moderate favorability for the occurrence of oil and gas. Under the partial alternative, no acreage with diatomite potential would be withdrawn, as this area would be in the nonsuitable portion, but 7,125 acres of moderate oil and gas potential would be withdrawn.

No acreage would be withdrawn under the **no wilderness/no action alternatives**.

Effects on Vegetation

Areas designated wilderness would not be subject to most surface disturbing activities. Vegetation dependent upon the existing undeveloped environment would thus be maintained.

The proposed brush control project on 780 acres would be completed under the **partial and no wilderness/no action alternatives**; it would temporarily reduce vegetation diversity by reducing sagebrush in the community and competition with grasses, allowing the grasses to increase in density.

The federal candidate species would receive the same protection as federally listed threatened or endangered species. The ONHP species of special interest would not be formally protected and would thus be subject to disturbance in areas recommended nonsuitable; however, this species could be designated as a BLM sensitive species and as such would receive the same protection as the federal candidate species.

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness.

Under the **all wilderness alternative**, wildlife benefits (primarily to antelope) which could be gained from the proposed brush control project would be foregone, since the project would not be allowed. But there would be no impacts to wildlife populations.

Under the **partial and no wilderness/no action alternatives**, the proposed brush control project would be implemented and could provide benefits to some wildlife species, primarily antelope, by increasing herbaceous vegetation. A portion of the brush control project may adversely affect deer winter range and about two-thirds of the area (above the 4,350-foot elevation) by decreasing winter deer forage.

Effects on Livestock Grazing

Under the **all wilderness alternative**, the proposal to control sagebrush on 780 acres would not be allowed, and the opportunity to increase forage production within the WSA would be foregone. As a result, the opportunity to increase licensed livestock use by up to 150 AUMs would also be foregone in the Mann Lake allotment. The proposed 2 miles of fence might or might not be allowed under the all wilderness and partial alternatives, depending on a site-specific assessment of whether it would conform with Wilderness Management Policy. If not allowed, an opportunity to increase forage through improved management and increase licensed livestock use by up to 250 AUMs in the Alvord allotment would be foregone. The proposed sagebrush control would be allowed under the **partial alternative**, producing an additional 150 AUMs of forage.

Both the sagebrush control project and the fence have benefit/cost ratios greater than 1:1.

Under the **no wilderness/no action alternative**, the proposed brush control and the fence would be implemented and 400 AUMs of additional forage would be produced.

Under all alternatives the forage produced from allowed projects (up to 250 AUMs under all wilderness and 400 AUMs under partial and no wilderness/no action) may be licensed if it is sustainable and all forage needs in the allotment have been considered.

Under the all wilderness alternative, closing of the interior way would not affect the grazing operator.

Effects on Recreation Use

There would be no significant impacts to recreation under any of the alternatives.

The quality of and opportunities for primitive recreation in the WSA would be maintained at their present level or improved under the **all wilderness and partial alternatives** due to restrictions on vehicle-oriented recreation.

The all wilderness alternative would affect current vehicle-oriented recreation which is primarily hunting for deer, antelope, and chukar. Currently, the only access within the WSA is a 1 1/2-mile way which closely parallels a boundary road. Its closure would not affect hunters. However, off-road restrictions would affect hunters because they frequently drive off-road on the flatter terrain, in the higher elevations.

In the area recommended suitable under the partial alternative, the effects on primitive recreation would be the same as the all wilderness alternative, while the area recommended nonsuitable would continue to be subject to disturbance from vehicles. Under the all and partial alternatives, some of the displaced vehicle-oriented hunting would be replaced by hunters using other access methods. Overall recreation use would decline or remain the same. Reductions would likely be lower under the partial than the all wilderness alternative.

Under the **no wilderness/no action alternative**, primitive recreation would continue to be adversely affected by other resource use including vehicle access routes and use. Vehicle-oriented recreation could realize some benefit from the development of range improvements if access routes into the area are increased. Overall recreation use would remain unchanged.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 6 and 7. Table 6 shows the effects on economic value and table 7, the effects on local personal income. It is not known at this time whether individual proposed structural developments for this WSA would be constructed if the area were designated wilderness. It is known that vegetative manipulation projects, such as the proposed sagebrush control, would not be allowed.

The columns for the wilderness alternatives show the effects as a range of values dependent upon whether structural improvements and/or grazing operator access were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The all wilderness and partial alternatives would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon grazing operators in the WSA would be an increase in cost of about $5 per year.

Table 6. Effects of Alternatives on Annual Economic Value, Lower Stonehouse WSA (OR-2-23M) (1981 price levels)

Item	Unit of Measure	All Wilderness	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +250	+150 to +400	+400
Oil and Gas Leases	Acres	-4,037	-3,412	0
VALUE OF PLANNED INVESTMENTS [2]				
Grazing	$	0 to +1,885	+1,131 to +3,016	+3,016
Investments [3]	$	0 to -379	-566 to -944	-944
Net Economic Value	$	0 to +1,506	+565 to +2,072	+2,072
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Reduced access [4]	$	-5	-5	0
Oil and Gas Leases	$	-4,037	-3,412	0
Total		-4,042	-3,417	
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	-4,042 to -2,536	-2,852 to -1,345	+2,072

[1] Expected future increases due to range improvement investments.

[2] A vegetative manipulation project involving $7,020 total expenditures, and a structural project involving $4,700. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[4] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 7. Effects of Alternatives on Local Personal Income, Lower Stonehouse WSA (OR-2-23M) (1981 price levels)

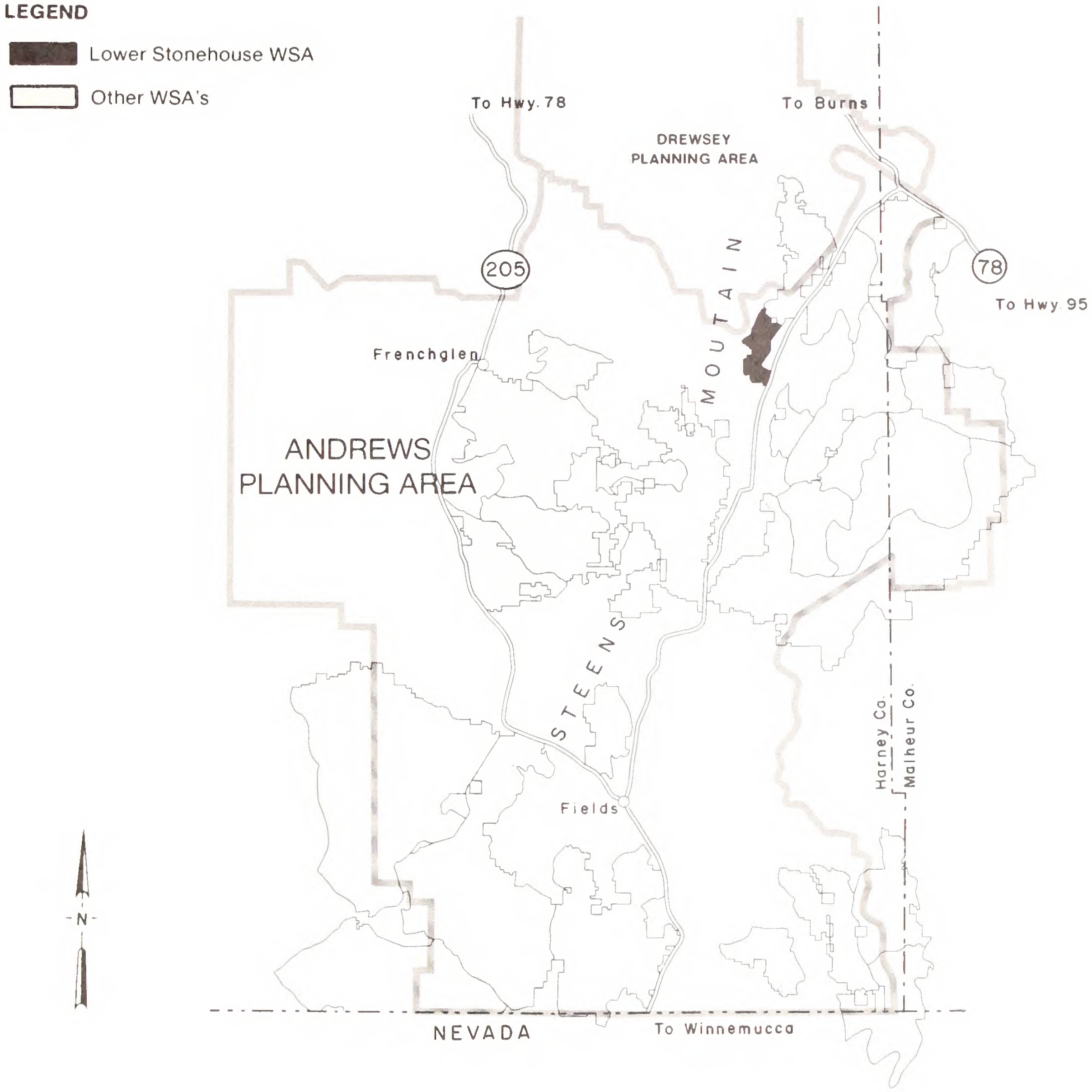
Item	Unit of Measure	All Wilderness	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +250	+150 to +400	+400
Oil and Gas Leases	Acres	-4,037	-3,412	0
INCOME FROM PROPOSED INVESTMENTS [2]				
Grazing	$	0 to +2,085	+1,251 to +3,336	+3,336
Construction activity [3]	$	0 to +1,631	+943 to +1,575	+1,575
Total [4]	$	0 to +2,085	+1,251 to +3,336	+3,336
INCOME FROM OTHER EXPECTED OUTPUT CHANGES				
Oil and Gas Leases	$	-1,216	-1,027	0
INCOME FROM ALL OUTPUT CHANGES				
All Categories	$	-1,216 to +869	+224 to +2,309	+3,336

[1] Expected future increases due to range improvement investments.

[2] A vegetative manipulation project involving $7,020 total expenditures, and a structural project involving $4,700. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[4] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 3.



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Bureau of Land Management

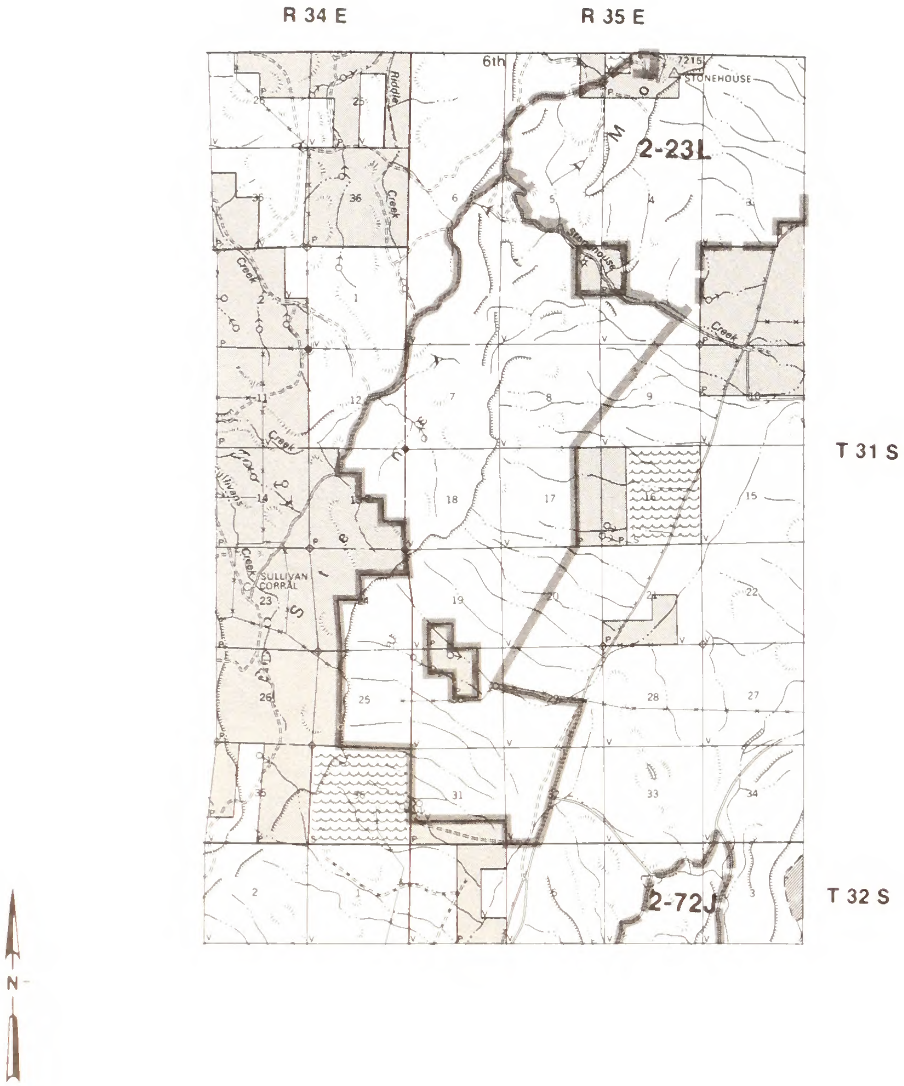
Burns District

Lower Stonehouse WSA
OR-2-23M

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

▬ ▬ Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

▨ Private

▤ BLM Surface-State or Private Subsurface (Split Estate)

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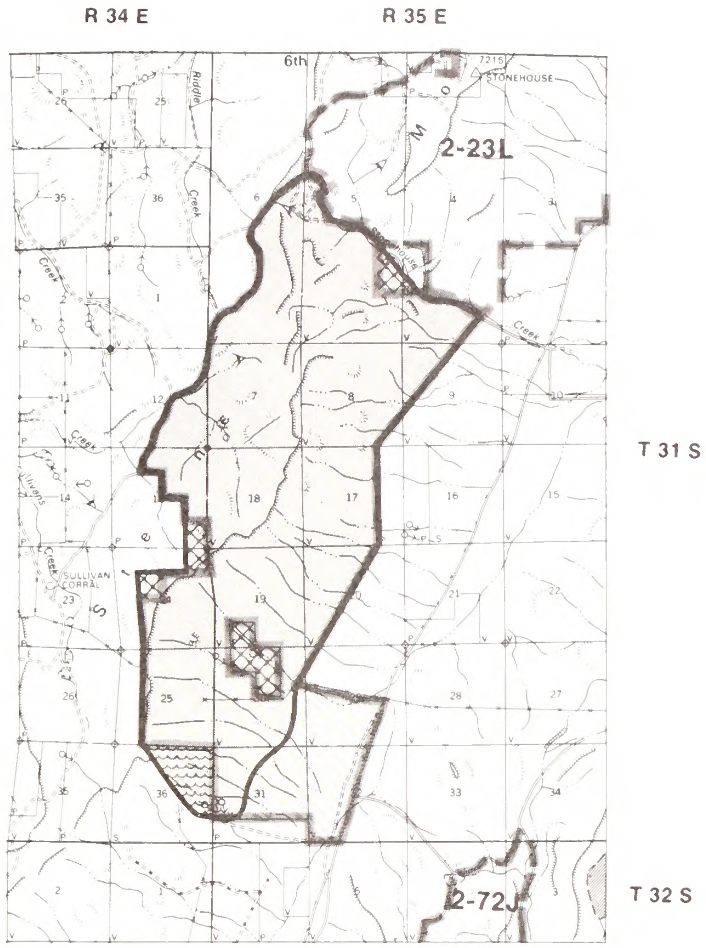
Lower Stonehouse WSA
OR-2-23M

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

▬ Wilderness Study Area Boundary

‐ ‐ Boundary of Adjacent Wilderness Study Areas

☐ Recommended Suitable for Wilderness

☐ Recommended Non-suitable for Wilderness

▩ Non-Federal Land within
Recommended Wilderness

▤ Non-Federal Minerals (Split Estate)
within Area Recommended for Wilderness

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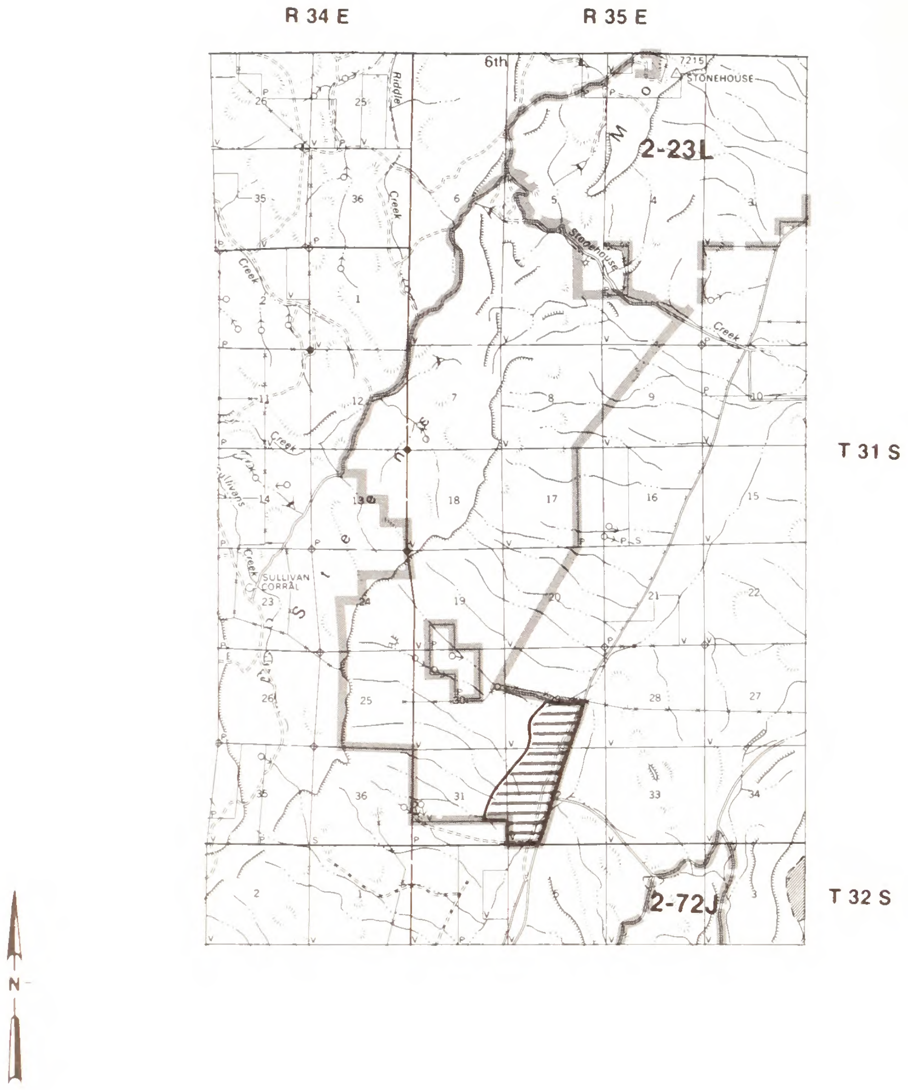
Lower Stonehouse WSA
OR-2-23M

PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 3



Entire WSA:
Medium Potential
(3B) for Oil and Gas

▤ **Medium Potential**
(3A) for Diatomite

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Lower Stonehouse WSA
OR-2-23M

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4

Lower Stonehouse WSA, OR-2-23M. Looking south showing the western slope of the plateau west of the ridgeline. Within the area recommended suitable under the partial and nonsuitable under the preferred (no wilderness/no action) alternative. The view is typical of the western side of the WSA. August 1983.

Lower Stonehouse WSA, OR-2-23M. A day hiker in an aspen stand along the east-facing escarpment near the northern end of the study area. Within the area recommended as suitable under the partial and nonsuitable under the preferred (no wilderness/no action) alternative. July 1983.

Lower Stonehouse WSA, OR-2-23M. Looking east down Stonehouse Creek which divides Lower Stonehouse from the adjacent Stonehouse WSA (OR-2-23L) to the north. Within the area recommended suitable under the partial and nonsuitable under the preferred (no wilderness/no action) alternative. A large rock outcropping rises high above the Stonehouse Creek drainage. July 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Sheepshead Mountains Group Wilderness Study Areas

Sheepshead Mountains (OR-2-72C)
Wildcat Canyon (OR-2-72D)
Heath Lake (OR-2-72F)
Table Mountain (OR-2-72I)
West Peak (OR-2-72J)
Palomino Hills (OR-3-114)

General Description of the Study Area

Six wilderness study areas (WSAs) are located in the Sheepshead Mountains: Sheepshead Mountains, Wildcat Canyon, Heath Lake, Table Mountain, West Peak, and Palomino Hills. The study areas are located southeast of Burns (about 65 miles) and northwest of Burns Junction (about 4 miles) in Harney and Malheur counties (see map 1). The nearest major highway is Oregon State Highway 78, which forms the northern boundary of the Sheepshead Mountains and Palomino Hills WSAs.

The six WSAs, referred to collectively in this appendix as the Sheepshead Mountains group, straddle BLM's Burns and Vale district boundary.

The six study areas together contain 201,000 acres of public land within an area 27 miles long (east to west) and 25 miles wide (north to south). The outside boundary of the combined area is formed primarily by roads, including Oregon State Highway 78 on the north and a county road on the northwest (see map 2). Small scattered parcels of private or split-estate land (federally managed surface, state or privately owned subsurface mineral rights) also form part of the boundary on all sides.

All of the study areas are separated by a network of BLM roads. These roads are used and maintained by BLM and the range users on an as-needed basis. The roads are also used by private landowners and recreationists. In addition, the area contains numerous parcels of split-estate land and several parcels of private land.

An area of public land totaling 15,200 acres is located along the western side of the group of WSAs and is referred to in this appendix as the Sulphur Springs area. Although not designated as a wilderness study area, the Sulphur Springs area is bounded on three sides by three WSAs and is included in one of the alternatives analyzed in this appendix.

The Sheepshead Mountains contain a variety of topographic features. The eastern and southern portions of the area include a plateau with elevations mostly above 5,000 feet. The eastern edge of this plateau is characterized by rolling hills and broad gentle fans which slope down to the 4,000 foot level. On the southern edge of the plateau, the descent to the lower elevations is much more abrupt and is typified by steep south facing ridgelines and a few deeply cut canyons.

The western edge of the Sheepshead Mountains group is much different in character. Like the southern portion of the area, the plateau ends abruptly near the center of the area along steep ridgelines which, in this part of the area, have west facing slopes. The remainder of the western side of the Sheepsheads area contains a series of steep east-facing ridgelines with gentle western slopes, separated by low basins or depressions. Most of the ridgelines in this part of the Sheepsheads reach an elevation of about 5,000 feet with the depression areas occurring at the 4,000 foot level, or slightly lower. Several of the basins are playa lakebeds which are seasonally flooded in early spring.

The dominant vegetation in all of the study areas is big sagebrush and bluebunch wheatgrass. Within portions of the individual study areas, other species are dominant. These include shadscale, greasewood, low sagebrush, and silver sage. Generally these species occur in small localized areas.

Sheepshead Mountains WSA

The Sheepshead Mountains WSA contains 51,120 acres of public land and is the largest of the six WSAs. Having an irregular oblong shape, the study area is about 13.5 miles long, from north to south, and averages about 6 miles in width. The boundaries of the area are formed by roads except for small portions of the north, east and west which are bounded by private and split-estate land. The boundary roads on the east, south and west are all BLM roads while the northern boundary includes portions of a state highway (on the northeast) and a county road (on the northwest).

Also forming part of the boundary are 5 dead-end roads. These roads enter the area from the northwestern and eastern sides of the WSA and total 11.5 miles. One of these roads ends within a 760-acre parcel of private land in the northern portion of the study area. Although entirely surrounded by BLM land, this parcel is actually part of the study area's boundary.

Within the boundaries of the WSA are four inholdings of split-estate land, totaling 2,560 acres and a 40-acre parcel of private land.

The most prominent physical feature within this study area is Sheepshead Ridge, a large, west-facing escarpment running 8 miles through the center of the area (from north to south) and rising between 600 and 1,300 feet above the lower elevation country to the west. East of the escarpment, the terrain gradually rises in elevation before sloping gently downward to the east. It is along this ridgeline that the study area reaches its highest elevation of 6,289 feet. The area east of the ridge is a high plateau of gently rolling hills and relatively shallow drainages.

West of the ridge, the study area consists of low lying basins, rounded buttes and foothills. The largest of the basins lies in the northwestern portion of the WSA and includes Folly Farm Flat and Sunrise Valley which at 4,060 feet, is the lowest portion of the study area.

Heath Creek, an intermittent stream, is the largest drainage in the WSA. It begins in the central portion of the study area east of the ridgeline, and winds its way south and then northwest through both broad valleys and a narrow canyon (where it cuts through the ridgeline) before leaving the study area on the western boundary. This creek and its tributaries drain most of the southern end of the study area.

Wildcat Canyon WSA

Southeast of the Sheepshead Mountains WSA is the Wildcat Canyon study area, containing 32,720 acres of public land. Somewhat rectangular in shape, this study area is about 12 miles long (northwest to southeast) and 6 miles wide (north to south). The boundaries of the area are formed by BLM roads on all sides with only scattered parcels of split-estate and one small parcel of private land also forming part of the boundary. One dead-end road enters the area from the north for about 2 miles and is also part of the boundary. The study area contains one 640-acre inholding of split-estate land.

Much of the area consists of open, gently rolling, sagebrush-covered hills characteristic of the southeastern edge of the Sheepshead Mountains plateau. This type of terrain is especially common around the perimeter and eastern side of the study area. However, the terrain is much more rugged in the west and central portions of the area, where plateau is deeply cut by several intermittent creeks which drain to the south. These drainages include Wildcat Creek, Mickey Creek, and Bone Creek. Along with their smaller unnamed tributaries, these creeks have formed a number of prominent canyons. Wildcat Canyon is the most pronounced of these drainages with rocky rims, steep walls, and a steep-sided canyon. Portions of both Wildcat Canyon and Mickey Canyon reach depths of 400 to 600 feet.

The highest point in the study area occurs along the western boundary, where the plateau reaches 6,100 feet. The plateau drops sharply at an east-west trending ridgeline along the southern side of the WSA to the lowest elevation in the WSA, 4,074 feet.

Heath Lake WSA

To the west of the Sheepshead Mountains study area lies the Heath Lake WSA. This irregularly shaped study area contains 20,100 acres, all of it public land. The WSA is 10.5 miles long (north to south) and 5 miles wide at its widest point.

Somewhat triangular in shape, the area is bounded on the east and south by BLM roads and two parcels of split-estate land. The western boundary is primarily formed by a county road but also contains private and split-estate land.

The dominant physical feature in this area is a ridgeline which runs north to south through the center of the WSA. The ridgeline drops sharply (600 to 800 feet) to the east along a steep, rocky, eastern face. At the base of the ridge, the topography is much less rugged with two intermittent lakebeds in the north (Heath Lake and South Lake) and some small ridges and buttes in the south. Along the southern boundary is another intermittent lake which is much smaller than either Heath or South Lakes. The western side of the WSA contains gently rolling hills and scattered rock outcroppings as the ridgeline slopes steadily down to the western boundary. The elevations in the study area range from a high of 5,128 feet on the ridgeline to a low of 4,076 feet in South Lake.

Table Mountain WSA

The Table Mountain wilderness study area is south of Heath Lake, southwest of the Sheepshead Mountains, and west of the Wildcat Canyon WSA. The Table Mountain WSA contains 38,600 acres of public land. The area is somewhat long (17 miles from north to south) and narrow (three to four miles) except in the northern portion where it widens to over eight miles. With the exception of three parcels of split-estate land (on the west, southwest, and south) and two parcels of private land on the south, the study area is bounded by BLM roads.

Two dead-end roads, each about one mile in length, enter the WSA from the east and form part of the boundary. One of the dead-end roads passes through a 640-acre section of split-estate land which is also part of the boundary, although it is almost entirely surrounded by the study area. Within the WSA is one section of split-estate land totaling 640 acres.

This WSA generally includes the southern plateau area of the Sheepshead Mountains and contains two prominent physical features: Table Mountain, a large flat-topped butte located in the north central portion of the area, which rises to an elevation of 6,060 feet; and a large, usually dry, flat, playa lakebed which lies along the southern boundary. This playa, locally known as the Mickey Basin, lies within a large basin which covers over 2,300 acres and is the lowest point in all six of the WSAs at 3,912 feet. The remainder of the study area consists of a variety of features including steep ridgelines and escarpments, relatively flat-topped tableland, and low elevation valleys around the perimeter.

The highest point in the WSA, and in the six WSAs, occurs along one of the ridgelines in the southwestern portion of the area. This ridge, Mickey Butte, reaches an elevation of 6,294 feet as it rises abruptly above the surrounding landscape to the south and east. This is one of the most impressive portions of the study area, as the rocky-faced escarpment towers nearly 2,400 feet above the adjacent Mickey Basin. The study area is cut by numerous intermittent streams, but there are no major drainages or perennial streams within the WSA.

West Peak WSA

West of Table Mountain WSA is the West Peak study area. The western-most study area of the Sheepshead Mountains group, West Peak contains 7,900 acres, all of it public land. With the exception of one parcel of split-estate land on the northwest, the boundaries of the study area are formed by BLM roads.

Containing the western foothills and basins of the Sheepshead Mountains area, the prominent feature of the study area is a ridgeline which runs north and south through the WSA and terminates with a 6,068-foot peak near the southern boundary. This ridgeline runs along the western side of the area and slopes moderately toward that boundary. The steep eastern side of the ridge drops sharply into a relatively flat portion of the WSA which contains widely scattered buttes. It is along the eastern side of the ridgeline near the northern boundary that the study area reaches its lowest elevation of 3,960 feet.

Palomino Hills WSA

The Palomino Hills WSA is located on the extreme eastern side of the Sheepshead Mountain group. It lies along the northern boundary of the Wildcat

Canyon WSA and east of the Sheepshead Mountains WSA. The study area contains 50,560 acres of public land in a rectangular shape which is nearly 15 miles long (northwest to southeast) and about 8 miles wide. There is one split-estate inholding of 640 acres in the WSA. With the exception of two parcels of private land (on the west and south) and several parcels of split-estate land (northeast, west and south), the area is bounded entirely by roads. The road on the northeastern boundary is Oregon State Highway 78 while all of the other roads are BLM roads.

One dead-end road penetrates the WSA from the east for about 2.5 miles and is also part of the study area boundary.

Lying on the eastern slope of the Sheepshead Mountains plateau, the Palomino Hills study area features a series of rolling hills cut by numerous intermittent drainages. The entire study area gradually slopes from the higher plateau country on the west to the flatter and lower elevation country on the northeast and east. The highest point in the WSA (5,808 feet) occurs on the plateau near the boundary with the Sheepshead Mountains study area, while the lowest point (4,020 feet) occurs near the eastern boundary.

Other features of the area include the southwestern edge of the Saddle Butte Lava Field, located in the western and northeastern portion of the study area. On the southwest side of the study area are two of the WSAs larger drainages. Both intermittent streams, Palomino and Antelope Creeks have carved short but substantial canyons (400 to 700 feet in depth), as they drain the Sheepshead plateau from west to east. The Palomino Hills, a series of small rolling hills, are located in the southeastern portion of the WSA.

Sulphur Springs Area

The Sulphur Springs portion of the Sheepshead Mountains group is located on the western side of the complex, south of Heath Lake WSA, west of Table Mountain WSA and north of West Peak WSA. This parcel of public land contains 15,200 acres in a long (9 miles north to south) and somewhat narrow (4.5 miles at the widest point) configuration. The area being analyzed is bounded by BLM roads and one parcel of split-estate land (northeast) on the three sides and a steep ridgeline on the west. A BLM road which passes through a 160-acre parcel of private land and a 640-acre parcel of split-estate land cuts through the center of the area.

The Sulphur Springs area is typical of the topography on the west side of the Sheepshead Mountains area: steep east facing ridges and low valleys and depressions. The highest point in the area (5,005 feet) occurs along Coffin Butte, a ridgeline on the east side of the area while the lowest point (3,960 feet) occurs in a basin at the base of the western ridgeline.

Interrelationships

The boundary of the Sheepshead Mountains group along Highway 78 follows the edge of a 75-foot-wide highway and utility right-of-way and the edge of 7 Oregon State Highway Division material sites.

Three other wilderness study areas also share common boundaries with the WSAs in the Sheepshead Mountains area. All of the adjacent study areas lie along the southern edge of the group and include the Alvord Desert (OR-2-74), East Alvord (OR-2-73A) and Winter Range (OR-2-73H) WSAs. The Alvord Desert WSA is adjacent to the Wildcat Canyon study area on the southeastern corner of the group. On the southwestern corner, the Table Mountain WSA is adjacent to both East Alvord and Winter Range study areas. All of the adjacent study areas are separated from the Sheepshead Mountains group by the Mickey Hot Springs Road. This BLM road is used and maintained by the BLM and livestock operators, and is also used by private landowners and recreationists.

The Oregon Department of Fish and Wildlife (ODFW) has identified the Mickey Basin/Table Mountain area (in the Table Mountain WSA) as suitable habitat for bighorn sheep. They have proposed to release sheep in the area sometime before 1987 as part of a program to reintroduce bighorns to their former range. This site is one of six potential transplant sites identified within BLM's Burns District and ranks third on ODFW's priority list for the area. Sheep released into the Mickey Basin area would likely use portions of the Table Mountain, Wildcat Canyon and Sheepshead Mountains study areas to the north.

The WSAs are part of three wild horse herd management areas (HMAs). Parts of Sheepshead Mountains, Heath Lake and Table Mountain WSAs are in the Heath Lake-Sheepshead HMA. All of Palomino Hills and parts of Wildcat Canyon and Sheepshead Mountains WSA are in the Sheepshead HMA. The Alvord-Tule Springs HMA includes parts of Sheepshead Mountains, Wildcat Canyon, Table Mountain and West Peak WSAs.

and 14,090 acres of split-estate land. These lands could be acquired through purchase or exchange with willing landowners.

Assuming acquisition of the private and split-estate land and addition of the 15,200 acres of public land in the Sulpur Springs area, total area recommended suitable under this alternative would be 231,870 acres.

As part of this alternative, all of the roads which serve as boundaries and separate the individual WSAs, as well as all of the dead-end roads which penetrate any of the study areas, would be closed. This totals 96 miles of roads. If it was determined that there was no practical alternative, livestock operators would be allowed to use vehicles on a limited basis to maintain range developments.

Minor boundary adjustments would be made to the overall form of the entire Sheepshead Mountains group, mostly from acquisition private and split-estate lands around the perimeter and from closing of the boundary roads. Instead of following the northern, western and southern boundaries of the West Peak, Table Mountain and Heath Lake WSAs (respectively), the boundary along the west would follow a 1/2-mile section of fence from the southern end of the Heath Lake WSA south along a ridgeline until it ties in with the northern boundary of the West Peak WSA. The road which crosses through the Sulphur Springs area would also be closed under this alternative and an attempt would be made to acquire the parcel of private and split-estate land.

The enhanced wilderness alternative would improve the manageability and wilderness values of the entire Sheepshead Mountains area. Closure of the interior dead-end roads would improve manageability and solitude by substantially reducing or eliminating vehicle use in the area. As a result of the decreased use, the roads would revegetate and become less noticeable, increasing naturalness of the area.

The acquisition of the private and split-estate inholdings and boundary parcels would improve the area's manageability and overall naturalness, eliminating the possibility of future development and access needs on those lands. There are no known plans for development of the inholdings.

The addition of the Sulphur Springs area to the Sheepshead Mountains group under this alternative would also improve the manageability and wilderness qualities of the area. Such an addition would include nearly all of the lands in the Sheepshead Region, adding acreage which has characteristics similar to the remainder of the area.

The manageability of the entire area (specifically the western portion of the group) would be improved by closure of three boundary roads which would otherwise be open to use. Also, the possibility of future development (on the public or private lands) would be precluded within this area, which would otherwise be surrounded by wilderness on three sides.

Preferred Alternative

The preferred alternative recommends 100,380 acres of public land within the Sheepshead Mountains group suitable as wilderness (see map 4). Under this alternative, all or part of three of the six wilderness study areas in the group would be combined and recommended as suitable for wilderness designation. The areas recommended as suitable include 43,160 acres of public land in the Sheepshead Mountains WSA, all 32,720 acres of public land in the Wildcat Canyon WSA, and 24,500 acres in the Table Mountain WSA. The roads which separate the three study areas and the dead-end roads which enter them, totaling 29.5 miles, would be closed.

In addition, certain inholdings and boundary parcels, both split-estate and private land, would be recommended for acquisition. An attempt would be made to acquire a total of 5,775 acres of land through purchase or exchange from willing landowners. This figure includes 435 acres of private land and 5,340 acres of split-estate land.

Assuming acquisition of private and split-estate land, total area recommended suitable under this alternative would be 106,155, acres.

The preferred alternative also recommends 100,620 acres of public land nonsuitable for wilderness. This includes portions of two study areas and all of three WSAs. The areas not recommended for wilderness include 7,960 acres of the Sheepshead Mountain WSA, all 20,100 acres of the Heath Lake study area, 14,100 acres in the Table Mountain area, all 7,900 acres of the West Peak WSA and all 50,560 acres of public land in the Palomino Hills WSA.

Existing boundaries of the study areas would change along the northern portion of the Sheepshead Mountains WSA and the southern end of the Table Mountain WSA. Otherwise, with the

HMA management, including the use of the trap site in the Sheepshead Mountains WSA, will not be significantly affected by any of the alternatives.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSAs, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for these WSAs include:

- potential geothermal, oil and gas, and other mineral resource development,

- potential to improve livestock use through range improvements such as reservoirs, spring developments, brush control projects and seedings, pipelines, wells and fences.

- possible development without wilderness designation, particularly its effect on plant species of special interest, raptor habitat and populations, kit fox habitat and potential habitat for bighorn sheep in the area,

- management of wild horses in the area (see Statewide EIS volume), and

- existing use of the area by military aircraft.

Also identified as an issue was the possibility of closing the roads between the study areas and combining the WSAs to form a single wilderness area, as well as adding a parcel of public land (the Sulphur Springs area, not in a wilderness study area) to the wilderness.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- preferred alternative
- no wilderness/no action

The enhanced wilderness alternative does not analyze the possible combination of the Table Mountain and Wildcat Canyon WSAs with the adjacent study areas to the south. The combination would not be practical due to the importance of the road which separates the WSAs. This road, the Mickey Hot Springs Road, provides access for a variety of users including livestock operators, recreationists, BLM range management personnel and private landowners. The road provides access to the southern end of the Sheepshead Mountains area and northern portions of the Alvord Desert Basin and Barren Valley areas, a large region where access is already limited. In addition, combining the study areas in the Sheepshead Mountains with the adjacent WSAs to the south would not substantially enhance the manageability of any of the study areas.

A partial alternative for each WSA also is not analyzed. There are no opportunities to eliminate or substantially reduce the size of individual study areas with resource conflicts and still retain an area which has the necessary wilderness qualities.

All Wilderness

The all wilderness alternative would recommend all of the public land in each of the wilderness study areas in the Sheepshead Mountains suitable for wilderness: 51,120 acres in the Sheepshead Mountains, 32,720 acres in the Wildcat Canyon, 20,100 acres in the Heath Lake, 38,600 acres in the Table Mountain, 7,900 acres in the West Peak, and 50,560 acres in Palomino Hills WSAs, totaling 201,000 acres (see map 2). Under this alternative each of the study areas would be recommended suitable as a separate wilderness area. The boundary and dead-end roads would remain open. For purposes of analysis, it is assumed none of the split-estate or private land in or adjacent to Sheepshead Mountains, Wildcat, and Table Mountain WSAs would be acquired.

Enhanced Wilderness

Under the enhanced wilderness alternative, the six WSAs would be combined and all 201,000 acres of public land in the WSAs plus 15,200 acres of public land outside of the WSAs (Sulphur Springs area) would be recommended as suitable for wilderness designation (see map 3). In addition, an attempt would be made to acquire all of the private and split-estate inholdings in the study areas, as well as adjacent private or split-estate lands, including parcels along all of the interior dead-end roads. The total amount of land recommended for acquisition would be 15,670 acres, 1,580 acres of private land exception of minor boundary changes due to the acquisition of private or split-estate lands and the closure of roads, the boundaries of the three study areas recommended for wilderness would not change.

In the extreme northern end of the Sheepshead Mountains study area, the boundary would follow a vehicle way which runs from the eastern boundary road west to the northcentral portion of the study area. From this point, the boundary would continue in a westerly direction along the summit of a ridgeline. About a mile from the northwestern boundary with the county road, the boundary would turn south and follow a drainage until it intersects the existing western boundary.

The northern portion of this study area is not recommended suitable under this alternative because this area is influenced by the outside sights and sounds of the state highway which forms most of the WSA's northern boundary, and the county highway which forms part of the northwestern boundary. In addition, manageability problems could also occur in this part of the WSA due to the presence of unmarked private land.

The area not recommended for wilderness in the southern portion of the Table Mountain WSA includes 14,100 acres of public land. The boundary of the preferred wilderness alternative would be drawn along a legal subdivision. From the existing western boundary of the Table Mountain study area, the boundary would turn east for about three miles along the legal subdivision. The boundary would then intersect a ridgeline and follow the crest of the ridge for about one mile until it joins with the existing southern boundary, the Mickey Hot Springs road.

The area to the south of this line includes the Mickey Basin area and several steep ridgelines and escarpments. This area is not recommended as suitable under the preferred alternative because of the potential value of the area for geothermal development. Almost all of this portion of the Table Mountain WSA has been rated as having high favorability for the occurrence of a commercially valuable geothermal resource.

The Heath Lake, West Peak and Palomino Hills wilderness study areas are not recommended as suitable for wilderness because of the areas' value for resource development and because it has limited wilderness values.

The land use which would probably occur in those portions of the Sheepshead Mountains group would be the same as under the no wilderness/no action alternative.

No Wilderness/No Action

The no wilderness/no action alternative would recommend all of the 201,000 acres in the six WSAs nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The areas would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued use of vehicles for livestock management and vehicle-oriented recreation (hunting),

- continued availability for mineral exploration and development, and

- implementation of proposed livestock and wildlife improvement projects, including construction of reservoirs, pipelines, wells and fences, in addition to several vegetative manipulation projects (brush control) for livestock; and construction of aquatic habitat projects, wildlife guzzlers, and other possible water developments for wildlife.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Areas as Wilderness

All of the wilderness study areas in the Sheepshead Mountains area would be manageable as separate wilderness areas under the all wilderness alternative. Manageability problems could occur in several of the study areas, however, due to the presence of scattered split-estate and private land inholdings. Some private and split-estate boundary parcels which extend into the study area could also cause similar management problems.

The manageability problem concerning the private and split-estate inholdings or boundary parcels affects five of the six WSAs in the complex. The

Table 1. Summary of Proposed Management Under Each Alternative, Sheepshead Mountains (OR-2-72C), Wildcat Canyon (OR-2-27D), Heath Lake (OR-2-72F), Table Mountain (OR-2-72I), West Peak (OR-2-72J), and Palomino Hills (OR-3-114) WSAs

Proposed Management	All Wilderness	Enhanced Wilderness	Preferred	No Wilderness/ No Action
Acres Designated as Wilderness	201,000	216,200	100,380	0
Acres Closed to ORVs by Wilderness Designation	201,000	216,200	100,380	0
Miles of Roads Closed	0	96	29.5	0
Miles of Ways Closed	117	121	62	0
Acres of Full Fee Estate Acquired [1]	0	1,580	435	0
Acres of Split Estate Acquired [1]	0	14,090	5,340	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	201,000	216,200	100,380	0
Structural Wildlife Projects Developed:				
Catchments and Guzzlers (number)	0-5	0-5	2-5	5
Wetlands Projects (number) [2]	0	0	1	1
Vegetative Manipulation for Wildlife:				
Seeding (acres) [3]	0	0	1,000	1,000
Structural Livestock Projects Developed:				
Reservoirs & Waterholes (number)	0-23	0-23	9-23	23
Springs (number)	0-1	0-1	0-1	1
Wells (number)	0-1	0-1	1	2
Pipelines (miles)	0-1	0-1	5	11
Fences (miles)	0-2	0-2	9	17
Storage Tanks (number)	0	0	0	1
Vegetative Manipulation for Livestock:				
Brush Control Without Seeding (acres)	0	0	2,880	15,100
Brush Control With Seeding (acres)	0	0	2,500	5,000
Unallocated Existing Forage Allocated (AUMs)	0-4,420	0-4,420	2,435-4,420	4,420

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

[2] The project involves placement of 4 dikes to create 30 surface acres of wetlands.

[3] No brush control is required for this seeding.

Heath Lake WSA is the only one that does not contain a private or split-estate inholding or have boundary parcel which protrudes into the study area.

Although no developments are planned for any of the parcels at this time, all of the private and split-estate lands are within an area of moderate potential for the occurrence of oil and gas. Some of the other parcels are also within areas which have moderate to high favorability for the occurrence of geothermal resources, or moderate favorability for metallic metals, diatomite, or zeolite. If development were to occur on any of these parcels, management of the area to preserve its wilderness values could be difficult.

A geothermal lease in the southern end of the Table Mountain WSA could be developed and create manageability problems before the area could be designated as wilderness. This potential problem would affect less than 500 acres. The lease contains no wilderness protection stipulations because it was issued before passage of the Federal Land Policy and Management Act in 1976. The leased lands could receive some physical disturbance either before or after wilderness designation.

The roads which separate the study areas and the dead-end roads which enter four of the WSAs would not present substantial problems with managing the area as wilderness. Although vehicle use of the roads would have an adverse effect on opportunities for solitude, such use is relatively infrequent. In addition, most vehicle use is confined to the existing roads. The roads are not normally used as access points for off-road vehicle activities.

Most of these manageability problems would be eliminated under the enhanced wilderness and preferred alternatives. Land acquisition, road closures, and boundary adjustments proposed under either of these alternatives should reduce or eliminate the potential management problems which could occur under the all wilderness alternative. The areas recommended as suitable under the enhanced wilderness and preferred alternatives would be manageable as wilderness.

Rationale for Selection of the Preferred Alternative

The area recommended as suitable within three wilderness study areas under the preferred alternative includes the central portion of the Sheepshead Mountains region. The area contains the large main ridge of Sheepshead Mountains (within the Sheepshead Mountains WSA) as well as most of the higher elevation, rolling plateau country to the east and south (also in the Sheepshead Mountains WSA and in the Wildcat Canyon WSA).

Table 2. Summary of Environmental Consequences of Alternatives, Sheepshead Mountains Group: Sheepshead Mountains WSA (OR-2-72C), Wildcat Canyon WSA (OR-2-27D), Heath Lake WSA (OR-2-72F), Table Mountain WSA (OR-2-72I), West Peak WSA (OR-2-72J), and Palomino Hills WSA (OR-3-114) and Sulphur Springs Area

Resource or Activity	All Wilderness	Enhanced Wilderness	Preferred Alternative	No Wilderness/No Action
Wilderness Values	Would add a total of 201,000 acres to NWPS as six separate wilderness areas. Maintains or improves level of quality for wilderness characteristics and protects the special features, except for possibility of energy and mineral development on private and split-estate inholdings. Preserves wilderness values associated with the Sheepshead Ridge, Table Mountain, Mickey Basin, Saddle Butte Lava Field, rugged canyons on the east side of the Sheepshead plateau and the low basins on the western side. Closure of 117 miles of ways to vehicular use would increase naturalness of the area and improve opportunities for solitude and primitive recreation. Although minor manageability problems could occur due to inholdings and possible energy development, the area would be manageable as wilderness.	Would add 231,870 acres to NWPs, assuming acquisition of 15,670 acres of private and split-estate land and addition of 15,200 acres of public land outside the WSAs (Sulphur Springs area). Combines all of six WSAs to form one wilderness. Includes all features in the all wilderness alternative, plus Sulphur Springs area. Closure of 121 miles of ways and 96 miles of roads would enhance the naturalness of the area and improve opportunities for solitude and primitive recreation. Road closures and acquisition of inholdings and boundary parcels improves the manageability of the area. The area would be manageable as wilderness.	Would add 106,155 acres to NWPS, assuming acquisition of 5,775 acres of private and split-estate land. Combines 43,160 acres of 2-72C, all 32,720 acres of 2-72D, and 24,500 acres of 2-72I in one wilderness. Maintains wilderness characteristics and special features of this area. Includes Sheepshead Ridge, Table Mountain, and the rugged canyons on the east side. Area is manageable as wilderness. Closure of 62 miles of ways and 29.5 miles of roads would increase naturalness of area and improve opportunities for solitude and primitive recreation. Wilderness values in 100,620 acres recommended nonsuitable, including those associated with Mickey Basin, Saddle Butte Lava Field and the western side would be subject to development, including mineral development and proposed livestock and wildlife improvements. These uses could adversely affect wilderness values.	Wilderness values and special features subject to disturbance from possible mineral development and proposed livestock and wildlife projects in all six WSAs.
Energy and Mineral Development	Development precluded on 201,000 acres, including 26,235 acres with moderate geothermal potential, 14,190 acres with high geothermal potential, 8,770 acres with moderate potential for metals, 13,480 acres with moderate potential for diatomite, 7,990 acres with moderate potential for zeolites and 201,000 acres with moderate potential for oil and gas.	Development precluded on 216,200 acres (including 15,200 acres of public land to be added under this alternative), plus an additional 15,670 acres of private and split-estate land, if acquired. Includes 26,235 acres with moderate geothermal potential, 14,190 acres with high geothermal potential, 8,770 acres with moderate potential for metals, 13,480 acres with moderate potential for diatomite, 7,990 acres with moderate potential for zeolites, and 216,200 acres with moderate potential for oil and gas.	Development precluded on 100,380 acres, plus an additional 5,775 acres of private and split-estate land, if acquired. Includes 16,700 with moderate geothermal potential, 1,280 acres with high geothermal potential, 2,180 acres with moderate potential for metals, 4,200 acres with moderate potential for diatomite, 900 acres with moderate potential for zeolites, and 100,380 acres with moderate potential for oil and gas.	No impact.
Vegetation	Vegetation preserved.	Same as all wilderness.	Vegetation preserved in suitable area. Proposed brush control on 2,880 acres and brush control and seed on 2,500 acres in nonsuitable area would alter vegetative composition and temporarily reduce vegetation diversity. The federal candidate species, and the ONHP species if designated a BLM-sensitive species, would be protected.	Same as nonsuitable area in preferred alternative, except brush control on 15,100 acres and brush control and seed on 5,000 acres.
Wildlife	Wildlife habitat preserved. Enhances area for reintroduction of bighorn sheep. Opportunities to improve wildlife habitat might be foregone. If 5 guzzlers are not built, possible increase in poplulation and distribution of upland game birds and big game would be foregone. Opportunities to create waterfowl habitat by constructing dikes and to improve habitat for antelope and non-game species by seeding 1,000 acres would be foregone.	Same as all wilderness.	Wildlife habitat preserved in suitable area. Wildlife projects allowed include 2 of 5 guzzlers, 1,000 acres of seeding and dikes in Mickey Basin. Smaller protected area could make reintroduction of bighorn sheep less desirable. Range improvements, if allowed, would increase availability of water and habitat for some species, particularly antelope. This could result in an increase of some species.	Livestock and wildlife improvements would benefit some species by improving available habitat and water distribution. Potential development may be detrimental to reintroduction of bighorn sheep.

Table 2. (continued)

Resource or Activity	All Wilderness	Enhanced Wilderness	Preferred Alternative	No Wilderness/No Action
Livestock Grazing	All proposed vegetative manipulation projects with associated structural improvements precluded, foregoing additional forage production in WSAs. Other structural projects to improve management may also be precluded, foregoing an opportunity to make additional forage available. Also foregone would be increases in licensed livestock use of up to 6,580 AUMs. Allocation of 1,985 AUMs of pastures in Sheepshead Mountains and Wildcat Canyon WSAs and 4,420 AUMs in Palomino Hills WSA might be foregone. Some impact to livestock operators from closing ways.	Same as all wilderness, except possible adverse effect to livestock operators from road closures in addition to way closures.	Some proposed vegetative manipulations precluded and production of additional forage foregone. Other projects may also be precluded, reducing the opportunity to make additional forage available in the WSAs. Possible increases in livestock use of up to 4,230 AUMs may be foregone. Allocation of 1,985 AUMs of available forage in pastures within Sheepshead Mountains, Wildcat Canyon and Palomino Hills WSAs might be foregone. Allocation of 1,989 AUMs of available forage in Palomino Hills WSA would be realized. Possible adverse effect to livestock operators from road closures.	All proposed projects allowed, increasing available forage. Up to 6,580 AUMS increase in licensed use could be realized in the allotments. 1,985 AUMs of available forage in Sheepshead Mountains and Wildcat Canyon WSAs and 4,420 AUMs in Palomino Hills WSA would be allocated.
Recreation Use	Use of motor vehicles for recreation restricted to dead-end and boundary roads. Possible increases in wildlife from projects could marginally increase recreation use. Such increases would not be sufficient to change overall recreation use.	Vehicle use for recreation eliminated. Possible increases in wildlife from projects could marginaly increase recreation use. Such increases would not be sufficient to change overall recreation use. Net reduction in overall recreation use.	Vehicles eliminated in suitable area. Primitive recreation subject to a reduction in quality in nonsuitable area. Possible increases in wildlife from projects could marginally increase recreation use. Such increases would not be sufficient to change overall recreation use. Some net reduction in overall recreation use.	Existing motorized uses would continue. Primitive recreation would be subject to disturbance by other activities. Possible increases in wildlife from projects could marginally increase recreation use. Such increases would not be sufficient to change overall recreation use. Overall, no change.
Economic Value and Local Income	Decrease in economic value and local personal income by $49,198 and $14,450 respectively, if proposed projects and increases from grazing adjustments (to use available but unallocated forage) and management are not allowed. Increase in economic value and local personal income by $6,890 and $102,691 respectively, if proposed projects and increases from grazing adjustments are allowed. The maximum increase in transportation costs to ranchers with grazing permits would be $1,215.	Same as all wilderness.	Decrease in economic value by $20,748 and increase in local personal income by $49,345, from construction of projects outside the suitable area, and if increases from grazing adjustments (to use available but unallocated forage) are not allowed. Increase in economic value and local personal income by $8,835 and $111,477 respectively, from construction of proposed projects. The maximum increase in transportation costs to ranchers with grazing permits would be $985	Increase in economic value and local personal income by $51,385 and $140,517.

Also included in the suitable area are flat, rock-edged plateaus (in Table Mountain WSA) and several steep winding canyons which cut sharply into the plateau (in Wildcat Canyon WSA).

This area is in a basically natural condition and has outstanding opportunities for solitude and several primitive recreation activities. Also included within the area are special features which include several plant species of special interest, and wildlife values including raptor and kit fox habitat, and suitable range for bighorn sheep.

Wilderness designation within the recommended portion of the Sheepshead Mountains, Table Mountain and Wildcat Canyon WSAs, would protect and maintain the areas' wilderness values and special features within an area which is capable of being managed to preserve these qualities. The boundaries as defined under the preferred alternative would also help to eliminate possible conflicts with a potentially high-value resource in the area, geothermal energy. Manageability of these WSAs would be improved with the closure of boundary roads and the acquisition of private and split-estate land inholdings and boundary parcels.

The benefits of preserving the areas' wilderness values would outweigh the benefits of leaving the area open to possible development. All of the suitable area under the preferred alternative has been identified as having moderate potential for oil and gas resources. A small portion of the area recommended suitable for wilderness in the Table Mountain WSA has a high favorability for geothermal resources and both Table Mountain and Wildcat Canyon study area are within areas having moderate favorability for geothermal resources. The area recommended suitable also has potential for occurrence of diatomite, zeolite, and metals as well as sites with potential for range developments which would improve livestock grazing opportunities.

In the rest of the area of the WSAs, the benefits of leaving the area open for mineral or range development would outweigh the benefits of preserving wilderness values.

In the northern portion of the Sheepshead Mountains WSA, the sights and sounds of vehicle use on the adjacent state highway lessen the wilderness values of this part of the study area. As in the remainder of this WSA, the northern end also is rated moderately favorable for oil and gas, diatomite and zeolite.

This part of the study area also contains a parcel of private land which extends into the WSA as part of the boundary. This parcel and some other private lands which form parts of the northern boundary could cause minor manageability problems. The wilderness values in this part of the WSA are not sufficient to warrant acquisition of these private lands, nor are they sufficient to outweigh the value of leaving this area open to other uses.

Almost all of the area recommended as nonsuitable in the southern end of the Table Mountain WSA has been identified as having high favorability for the occurrence of geothermal resources with the remainder of the area having moderate favorability for geothermal. Most of this area is included in the Alvord KGRA and a small part of the area contains a lease which does not have wilderness protection stipulations and could cause a manageability problem. The portion recommended as nonsuitable also has moderate potential for oil and gas and diatomite.

Part of the area near Mickey Basin has been proposed as a site for the construction of a waterfowl habitat project. Although this part of the Table Mountain WSA has good wilderness values, they are not sufficient to outweigh the value of leaving the area open to other resource uses.

Within the Heath Lake study area, there is a proposal for a large vegetative manipulation project on the eastern side, which would also contain several miles of pipeline and fences. In the West Peak WSA, the potential for geothermal resources is rated moderate to high, and a vegetation manipulation project is also proposed along the western boundary. Both areas have moderate potential for the occurrence of oil and gas and diatomite. The wilderness values in these areas do not outweigh the potential value of developing the other resources.

The Palomino Hills WSA was recommended as nonsuitable for wilderness primarily because of the limited wilderness values throughout a large part of the area. Although the area is large enough to provide opportunities for solitude, much of the northern and eastern portions are influenced by the state highway which forms much of this boundary. The highway, the use it receives, the developments which occur within its right-of-way, and the general lack of topographic or vegetative screening reduce the wilderness values in this portion of the WSA.

There are somewhat more wilderness values in the southern and western portions of the study area, but they are insufficient to outweigh the value of leaving the area open to other uses. The entire area has a moderate potential for oil and gas, diatomite and zeolite, and there is a potential to increase livestock use through the development of reservoirs.

Affected Environment

This section discusses only those activities or resources which influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

All six WSAs exhibit a high degree of naturalness, with much of the study areas devoid of man-made features. Most of the developments are unobtrusive because they are small and usually screened by either topography or vegetation.

Table 3 shows the type and number of developments within each WSA and the percentage of the amount of the WSA which is influenced by these features. (The area of influence is an estimate of the acreage in the WSA from which these man-made features can be seen.)

The majority of the developments in the Sheepshead Mountains WSA are in the eastern part of the study area. There also are reservoirs in the southern end of the WSA. The reservoirs and ways are generally minor disturbances and are screened by topography. However, the location of many ways in drainages makes them visible from the higher terrain.

One of the ways in the WSA leads to a horse trap site. While there are no physical structures at the location at this time, the trap may be used in the

Table 3. Man-made Developments in the Sheepshead Mountains Group, WSAs OR-2-72C, 72D, 72F, 72I, 72J, and 3-114, and Sulphur Springs Area

Development	Sheepshead Mountains (2-72C)	Wildcat Canyon (2-72D)	Heath Lake (2-72F)	Table Mountain (2-72I)	West Peak (2-72J)	Palomnio Hills (3-114)	Sulphur Springs
Number of Ways	20	11	4	11	1	8	1
Number of Miles	40.5	20	9	22	0.5	25	4
Fences							
Number of Fences	3	2	4	9	1	--	4
Number of Miles	9.4	13	1.5	13	0.25	--	6
Water troughs	5	--	1	--	2	--	-
Spring developments	7	8	-	--	-	5	-
Reservoirs	30	20	7	24	3	10	6
Wells	--	--	-	3	1	--	1
Borrow Pits	1	-	1	--	-	7	-
Seeding (crested wheatgrass)	1	-	-	--	-	--	-
Corrals	2	1	-	--	-	--	-
Cabin	1	--	2	--	-	--	-
Percent of WSA influenced	17	13	7	15	3	11	-

future. The site now has a minimal influence on the naturalness of the area, although the access route to the site (the wzy) is quite visible from the top of the Sheepshead ridgeline. The other developments are located in the northern part of the study area.

In Wildcat Canyon WSA, the reservoirs are scattered throughout the study area, but the main concentration is on the western side. The reservoirs are generally small and screened by topography. The ways are also generally screened by topography, but in the eastern part of the WSA several ways are located within broad, shallow valleys and are visible from the surrounding area.

The reservoirs and ways in Heath Lake WSA are small, but frequently visible from the surrounding higher terrain. The fences are generally unnoticeable.

In Table Mountain WSA, ways are the primary influence on naturalness of the area. The ways frequently pass at the base of the escarpments and are visible from the surrounding higher terrain. Although several of the ways were actually constructed, they were not identified as roads due to lack of use and maintenance. However, this construction tends to make the ways visible from a greater distance.

The water developments are generally small and inconspicuous. However, some are easily viewed from surrounding higher terrain. The water developments in the southwest corner are the most visible because they are located at the base of a broad open slope.

In West Peak WSA, man-made developments have a very slight influence. They are generally minor disturbances and screened by topography.

Roads and ways have the greatest influence on Palomino Hills WSA. They are generally concentrated in the northern half of the WSA. The 7 borrow pits are also located here. The reservoirs are scattered throughout the WSA and are well screened by topography.

The Sulphur Springs area developments are scattered throughout the area. They generally are small but can sometimes be viewed from the higher elevations.

The primary source of outside sights and sounds in these WSAs is the boundary roads. Affecting the northern part of Sheepshead Mountains WSA and the entire northern side of Palomino Hills WSA is State Highway 78, visible from long distances. In Palomino Hills WSA, the highway's influence extends well inside the WSA, influencing ridges and hilltops over a mile away.

In Heath Lake and West Peak WSAs, the area west of the main ridge is influenced by the Folly Farm-to-Fields county road and the ranching activities at Juniper and Mann Lake ranches. The other WSAs are not substantially influenced by outside sights and sounds.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Each of the six WSAs is large enough to allow dispersed use and provide outstanding opportunities for solitude. The primary screening factor within each WSA is topography.

Excellent topographic screening exists in nearly half of the Sheepshead Mountains WSA and opportunities for solitude are outstanding. The major topographic feature is the Sheepshead ridge running north-south through the center of the study area. In the south and west, rolling hills and small drainages add to the topographic diversity and enhance the opportunities for solitude. The northern and southeastern areas are relatively flat and have few opportunities for solitude.

Opportunities for solitude are outstanding in the west, central and southern parts of the Wildcat Canyon WSA because of the topographic screening provided by rimrocks and the canyons of Wildcat, Mickey and Bone Creeks. The remainder of the area consists primarily of rolling hills that provide slight topographic screening.

In Heath Lake WSA, opportunities for solitude are outstanding. The hills, buttes, and ridges in the northeastern and southeastern portions of the study area provide moderate amounts of topographic screening and enhance opportunities for solitude.

Opportunities for solitude in the Table Mountain WSA are outstanding due to the excellent topographic screening throughout the area. Table Mountain, Mickey Butte, and the other steep escarpments provide topographic diversity and enhance the opportunities for solitude. The Mickey Basin area does not contain much topographic screening, but tall shrubs provide vegetative screening.

The West Peak WSA has outstanding opportunities for solitude. The main ridgeline, the peak, and the small hills and buttes on the east side of the WSA provide sufficient screening to enhance opportunities for solitude.

Opportunities for solitude in the Palomino Hills WSA are outstanding. The western two-thirds contains most of the available topographic screening. The drainages of Palomino, Antelope and Johnny Creeks, as well as the relief of Saddle Butte Lava Field, enhance the opportunities for solitude.

The Sulphur Springs area does not provide outstanding opportunities for solitude. With the exception of the ridgeline which runs along its eastern side (Coffin Butte) there is little topographic diversity or screening to enhance solitude.

Military jet aircraft use the Sheepshead Mountains area frequently for low altitude training flights. The influence of these flights on a visitor's perception of solitude and, to some degree, naturalness, is extreme for a short period of time (1 to 2 minutes), but it is also quite temporary. These flights do not have a long lasting, adverse effect on a visitor's opportunity to find solitude.

The study areas provide excellent opportunities for primitive and unconfined types of recreation. The major drainages and ridges provide a number of day hiking, backpacking and horseback riding routes that vary greatly in distance and difficulty. Campsites along these routes are abundant, but the availability and quality of water is a problem. Interesting geological formations and panoramic desert vistas provide opportunities for sightseeing and photography.

Good opportunities for day hiking, backpacking and camping and sightseeing occur throughout the Sheepshead Mountains WSA. Primary attractions would be the vistas of Steens Mountain and the Alvord Desert from the Sheepshead ridge and the challenging hiking provided by the ridge and the Heath Creek drainage.

In Wildcat Canyon WSA, the opportunities for hiking, backpacking and camping, and sightseeing are good. Most day hiking and backpacking would occur in the scenic and rugged Mickey, Bone, and Wildcat Creek Canyons. Scenic views of the Alvord Desert and Steens Mountain are also available.

The best opportunity for primitive recreation in the Heath Lake WSA is sightseeing. Scenic vistas of the surrounding area include the Steens and Sheepshead Mountains. These views are excellent and show the expansive and open nature of the Sheepshead area. Day hiking and backpacking opportunities are available but are only of moderate quality.

Table Mountain WSA has good opportunities for a variety of primitive recreational activities, including day hiking, backpacking and camping, horseback riding, and sightseeing. Due to the topographic diversity in the area, there are many interesting and challenging areas to hike. The Mickey Basin area would be attractive to those wanting an easy but interesting hike. Mickey Butte, in the southwestern corner, Table Mountain, and the other escarpments around it would provide a longer, more challenging hike. Horseback riding is also good, with the existing vehicle ways providing routes through some of the steeper areas. Broad vistas of the Steens, Trout Creek and Pueblo Mountains and the Alvord Desert are available from the many high points and offer excellent opportunities for sightseeing and photography.

There are good opportunities in the West Peak WSA, for day hiking and sightseeing. The main north/south ridgeline with its east-facing escarpment offers a variety of challenges for hikers. Spectacular views of Steens Mountain, Sheepshead Mountains and Alvord Desert offer excellent opportunities for photography and sightseeing.

Palomino Hills WSA contains opportunities for day hiking, backpacking, horseback riding and sightseeing, but they are only of moderate quality. Few unique or attractive areas exist, but the Saddle Butte Lava Field and drainages of Palomino, Antelope and Johnny Creeks would be of interest for some users.

Opportunities for day hiking and sightseeing area available within the Sulphur Springs area but these are only of moderate quality.

Special Features

The west face of Sheepshead Mountain in the Sheepshead Mountains WSA is one of a series of steep fault scarps which formed the basin and range topography of much of southeastern Oregon.

Uncommon vegetation, wildlife and outstanding scenic quality are special wilderness features in some of the areas.

Plant species of special interest grow in four of the WSAs. (See the Vegetation section for more information on these plants.)

The entire area is habitat for kit fox, which is on ODFW's list of threatened species, but the best habitat is in the southern end of Palomino Hills and Wildcat Canyon WSAs.

Raptor nesting habitat occurs along the high rims and escarpments in Sheepshead Mountains, Table Mountain and West Peak WSAs. American kestrels, prairie falcons, and golden eagles are the primary raptor species in the area. ODFW has also identified Sheepshead Mountains and Table Mountain WSAs as potential habitat for bighorn sheep, which were once native to the area.

Scenic quality is a special wilderness feature of Heath Lake and West Peak WSAs. The areas west of the main ridgeline have outstanding scenic quality. The view in these areas is west to the top of Steens Mountain and includes Mann Lake, Juniper Lake and other lakes. This area contains high quality and contrasting visual characteristics and is easily viewed by a large number of people.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler System of classifying ecosystems, all six WSAs are in the Intermountain Sagebrush Province. The potential natural vegetation of Heath Lake WSA and Sheepshead Mountains WSA is sagebrush steppe. The potential natural vegetation of the other 4 WSAs and of the Sulphur Springs area is sagebrush steppe, except for small areas where it is saltbush-greasewood.

Vegetation communities listed in the Oregon Natural Heritage Plan and found in each of the WSAs are listed in table 4. Communities in the Palomino Hills WSA are listed in the Owyhee Uplands section of the plan. Communities in the other WSAs and the Sulpur Springs area are listed in the Basin and Range section of the plan.

The WSAs are within 5 hours' driving time of the major metropolitan area of Boise, Idaho.

Table 4. Ecosystems of ONHP within the Sheepshead Mountains Group, WSAs OR-2-72C, 72D, 72F, 72I, 72J, and 3-114, and Sulphur Springs Area. (x denotes occurrence in WSA)

Basin and Range Province Ecosystems	Sheepshead Mountains (2-72C)	Wildcat Canyon (2-72D)	Heath Lake (2-72F)	Table Mountain (2-72I)	West Peak (2-72J)	Palomino Hills (3-114)	Sulphur Springs Area [1]
big sagebrush/bluebunch wheatgrass [2]	x	x	x	x	x	x	x
low sagebrush/bluebunch wheatgrass [2]	x					x	
low sagebrush/Sandberg's bluegrass	x	x					
shadscale-bud sage-spiny hopsage community complex		x		x	x		x
silver sage community [2]	x		x			x	
bare playa and playa margin communities			x	x	x		x
big sagebrush-spiny hopsage community				x	x		x
big sagebrush-greasewood				x			x
greasewood/saltgrass community				x	x		x
winterfat community				x			
Alkaline vegetation mosaic with representative communities including greasewood, shadscale, saltgrass, and spiny hopsage types [3]						x	

[1] Area recommended as wilderness under enhanced wilderness alternative, not in a WSA.
[2] Ecosystems found in both Basin and Range Province and Owyhee Uplands Province of ONHP.
[3] Owyhee Uplands Province ecosystem.

Energy and Mineral Development

The geology, energy and mineral resources of the six WSAs were evaluated by interpreting existing literature, reviewing mining and mineral leasing records, and correlating rock units in the WSAs with similar units known to contain mineral deposits. Technical details of the findings of the valuation are in a report prepared by TERRADATA, a BLM contractor, titled "Assessment of Geology, Energy and Mineral Resources of the Sheepshead Mountain Geologic Resource Area", report No. OR-023-18, and in a BLM report on the assessment of mineral resources in the South Harney Geologic Resource Area.

The WSAs are within the geologic resource areas which have been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire area of all six WSAs is considered to have a moderate potential for oil and gas. This is based on the assumption that the Paleozoic marine boundary lies east of these WSAs, and thus there is the possibility of oil-bearing marine sediments at depth. As of January 1, 1984, four of the WSAs have oil and gas leases. These are: Sheepshead Mountains - two leases covering 3,700 acres; Heath Lake - two leases covering 4,695 acres; Table Mountain - nine leases covering 18,000 acres, and West Peak - four leases covering 6,826 acres.

The southern portions of Table Mountain and West Peak WSAs have a high potential for geothermal resources. These areas are within or adjacent to the Alvord Known Geothermal Resource Area. Following legal subdivisions the KGRA boundary covers all of the Mickey Basin and most of the high ridges and escarpments within the southwestern portion of the Table Mountain study area. Available data indicate that the Mickey Basin area has potential for generating up to 160 megawatts of electricity from geothermal steam.

The remainder of West Peak WSA, part of Table Mountain WSA, and part of Wildcat Canyon WSA are considered to have a moderate potential for geothermal resources. In the West Peak WSA, there was one geothermal lease covering 550 acres, and there were six geothermal leases covering 7,376 acres within the Table Mountain WSA, as of January 1, 1984. The other 4 WSAs are considered to have low favorability for geothermal resources and none of them had geothermal leases as of January 1, 1984.

Parts of the Sheepshead Mountains, Wildcat Canyon, Heath Lake, Table Mountain, and West Peak WSAs have a moderate favorability for the occurrence of gold, silver, copper and mercury.

Silver, copper and mercury are strategic and critical mineral commodities; but there are no known strategic and critical mineral deposits within these WSAs. As of January 1, 1984, no mining claims were recorded in any of these study areas.

Diatomite has moderate potential in portions of all six WSAs. Diatomite occurs in tuffaceous lacustrine (lake) sediments in southeastern Oregon.

Parts of the Sheepshead Mountains and Palomino Hills WSAs have a moderate favorability for the occurrence of zeolites. The potential for this resource is low in the remainder of the study areas.

Table 5 shows the mineral potential classifications in the six WSAs and the Sulphur Spring area.

Map 5 shows the portions of the WSAs rated high or moderate (medium) for geothermal and moderate (medium) for metals and diatomite, as well as the portions within the KGRA boundary.

Surface rocks consist predominantly of Tertiary volcanics, and Tertiary and younger volcaniclastic sediments. The volcanic rocks are mainly basalts and andesites which occur as numerous thin flows with a cumulative thickness of several hundred feet. Interlayers of tuffs and tuffaceous sediments are present. This volcanic sequence is correlative to the Steens Basalt, and may partially correlate with the Steens Mountain Volcanic Series as well.

Sedimentary deposits are mostly volcanically-derived lake deposits, fluvial deposits, alluvium, and

Table 5. Classification of Energy and Mineral Potential, Sheepshead Mountains Group, WSAs OR-2-72C, 72D, 72F, 72I, 72J, and 3-114, and Sulphur Springs area (SS)

Commodity	Area	Classification Level	Confidence Level
Metals (gold, silver, copper, mercury)	Parts of 2-72C, 2-72D, 72F, 72I, 72J [1]	3	B
	2-72F, 2-72I, 2-72J, 3-114;	2	B
	Parts of 2-72C, 2-72D, SS	2	B
Geothermal	Parts of 2-72I, 2-72J [1]	4	D
	Parts of 2-72D, 2-72I, 2-72J [1]	3	B
	3-114, SS; part of 2-72D, 2-72I	2	B
	2-72C, 2-72F	1	B
Uranium/Thorium	2-72F	2	C
	2-72C, 2-72D	1	B
	2-72I, 2-72J, 3-114, SS	1	A
Coal	2-72C, 2-72D, 2-72I, 2-72J, SS	2	C
	2-72F	2	A
	3-114	1	B
Oil/Gas	Entire area (all WSAs and SS)	3	B
Tar Sands/Oil Shale	2-72C, 2-72D	2	A
	2-72I, 2-72J, 3-114, SS	1	C
	2-72F	1	B
Limestone	2-72C, 2-72D, 2-72I, 2-72J, 3-114, SS	2	A
	2-72F	1	B
Bentonite	Entire area (all WSAs and SS)	2	A
Diatomite	Parts of all WSAs [1]	3	B
	Parts of all WSAs and SS	1	B
Zeolites	Parts of 2-72C, 3-114 [1]	3	B
	2-72D, 2-72F, 2-72I, 2-72J, 3-114, SS	2	A
Sodium	Entire area (all WSAs and SS)	2	A

[1] See map 5

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

colluvium. These are generally unconsolidated Quaternary deposits.

Pre-Tertiary or basement rocks have not been found within these WSAs. There is only minimal data available on the subsurface geology, and the deep subsurface has not been explored.

Vegetation

Vegetation communities in the Sheephead Mountains group varies from those associated with alkaline basins and playas to those on the steep rocky slopes and tops of the Sheepshead Mountains.

The most extensive community over the whole area is big sagebrush/bluebunch wheatgrass. It occurs on the gently rolling uplands and on the steep slopes throughout the WSAs. Species currently present in this community include Thurber's needlegrass, Sandberg's bluegrass, cheatgrass, rabbitbrush, and big sagebrush. Spiny hopsage grows in the lower elevation fans of this community. Bluebunch wheatgrass occurs on the steeper slopes and on the uplands, at the highest elevations.

In Palomino Hills WSA, bluebunch wheatgrass is a dominant species on the area of recent lava flows, known as Saddle Butte Lava Fields, in the northern part of the study area. West Peak WSA contains one small north slope which is dominated by three-tip sagebrush. This is the only occurrence of three-tip sagebrush in the area.

The estimated successional stage on the flat to gently rolling areas is mid-seral. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.)

Late-seral communities are found on the steep rocky slopes. The primary species in the climax community is bluebunch wheatgrass. Big sagebrush is a minor component.

A shadscale-Indian ricegrass community is one other community common in the area. It occurs in four of the WSAs and in the Sulphur Springs area including: on the rocky fans and slopes above the alkaline flats in the southern end of Table Mountain WSA; on the alluvial fans north of Wildcat Creek in the southern part of Wildcat Canyon WSA; in the eastern part of West Peak WSA; on the fans in the southern and eastern parts of Palomino Hills WSA; and on fans above the playa in the Sulphur Springs area.

The grass species which occur in these areas are bottlebrush squirreltail, Sandberg's bluegrass, Thurber's needlegrass and cheatgrass. Shrub species include shadscale, budsage, spiny hopsage, rabbitbrush, horsebrush and big sagebrush. The estimated successional stage is early to mid-seral. The climax community contains Indian ricegrass and shadscale as the primary species, and budsage and bottlebrush squirreltail as secondary species.

The remaining vegetation communities occur in only three or fewer of the study areas and are generally minor in extent. They include low sagebrush/bunchgrass, silver sage community, Great Basin wildrye community, playa margin communities, saline meadows and a winterfat community.

Low sagebrush communities occur in Sheepshead Mountains, Palomino Hills, and Wildcat Canyon WSAs. This community occurs in two places: the shallow rocky soils in the northwest corner of Wildcat Canyon WSA and southeast corner of Sheepshead Mountains WSA and west of the Saddle Butte Lava Flows towards the north ridge of the Sheepsheads Mountains in the Palomino Hills and Sheepshead Mountains WSAs. These areas currently contain low sagebrush, bluebunch wheatgrass, Sandberg's bluegrass, bottlebrush squirreltail, cheatgrass, phlox and goldenweed. The estimated successional stage of the low sagebrush communities is late-seral. The climax community contains bluebunch wheatgrass and low sagebrush. Sandberg's bluegrass replaces bluebunch wheatgrass where the soil is very shallow and rocky.

Silver sagebrush communities occur in three of the WSAs. The largest of the silver sage communities is at Folly Farm Flat in Sheepshead Mountains WSA. Silver sage communities also occur in the Sunrise Valley and Opal Valley areas of this WSA. Small communities occur in the Dry Lakes area on the border between Sheepshead Mountains WSA and Palomino Hills WSA, and in the northern end of Heath Lake WSA along its border with Sheepshead Mountains WSA. Species currently growing in this community include cheatgrass, creeping wildrye, giant wildrye, big sagebrush and silver sagebrush. The estimated successional stage is early to mid-seral. The climax vegetation is silver sagebrush, creeping wildrye and mat muhly.

The playa margin communities occur in Table Mountain WSA, West Peak WSA and in the Sulphur Springs area. Greasewood and saltgrass occur extensively throughout the Mickey Basin area in Table Mountain WSA. Greasewood is also present in the playa near Sulphur Springs and in West Peak WSA. Greasewood occurs in conjunction with big sagebrush on the eroded alkaline fans around the basins. Bottlebrush squirreltail, ryegrass and cheatgrass grow in the big sagebrush-greasewood areas. The estimated successional stage of the greasewood communities is early-seral. The primary climax species in the basins are inland saltgrass, alkali sacaton and greasewood. Indian ricegrass, big sagebrush and greasewood are the climax species on the alluvial fans.

In Table Mountain WSA, small meadows dominated by saltgrass and rushes occur on the margins of the playas and near springs. There is also a small hummocky meadow at Sulphur Springs in the Sulphur Springs area. It is dominated by rushes and sedges. Great Basin wildrye and greasewood may also occur in these areas. The estimated successional stage is mid-seral. The climax species include Lemon alkaligrass, alkali bluegrass, inland saltgrass, rushes and sedges.

The Great Basin wildrye community is minor in extent and is associated with the alluvial fans around Heath Lake and South Lake in the Heath Lake WSA and the Sulphur Springs area. The current vegetation is mostly big sagebrush and annual forbs and grasses. The estimated successional stage is early seral. The primary climax species is Great Basin wildrye. Secondary species are big sagebrush and sod bluegrasses.

There are small winterfat communities on the upper margins of the basins in Table Mountain WSA. The estimated successional stage is early to mid-seral. The climax vegetation is primarily winterfat. Nuttal's saltbush, Indian rice grass, creeping wildrye and squirreltail also occur in minor amounts.

Three plant species of special interest (mentioned in the Special Features section) occur in four of the areas. Two plants are candidate species for federal listing as threatened or endangered: *Astragalus solitarius* (weak milk-vetch), which occurs in Table Mountain and Sheepshead Mountains WSAs; and *Lepidium davisii* (Davis' pepper cress), which occurs in Palomino Hills WSA. One other plant species, *Allium lemmonii* (Lemmon's onion), occurs in Heath Lake and Sheepshead Mountains WSAs and is on list 2 of the Oregon Natural Heritage Plan's "Rare, Threatened, and Endangered Plants and Animals of Oregon."

Wildlife

This area has limited water which has a strong influence on wildlife during the warmer months. Lack of perennial water in the areas limits the diversity and abundance of vegetative and animal species. Most of the wildlife is nongame species which inhabit the big sagebrush, low sagebrush and salt desert shrub habitats covering most of the area.

Coyotes, black-tailed jackrabbits, least chipmunk, antelope ground squirrel, sage sparrow, Brewer's sparrow, horned lark and western rattlesnake are a few of the species found in the area. Raptors common to the area include golden eagle, prairie falcon, and American kestrel.

Kit fox, on the Oregon Department of Fish and Wildlife list of Threatened or Endangered Wildlife, may be found in the WSAs. This is the northernmost part of the kit fox range.

Sage grouse and antelope use the Sheepshead Mountains WSA, especially for spring to fall range. Mule deer are sparsely scattered throughout the WSA. Present deer populations are estimated at 150 head, yearlong. Chukar are common near water sources during most years.

ODFW has identified the Sheepshead Mountains and Table Mountain WSAs as having excellent potential for the re-establishment of California desert bighorn sheep.

Antelope infrequently use the Wildcat Canyon WSA. Sagebrush removal proposed to improve livestock forage in the WSA could also improve antelope habitat. A small population of sage grouse are believed to summer at higher elevations in the northern portions of the WSA. Also, 3 wildlife guzzlers (small wildlife watering devices) are proposed in the WSA which would increase the availability of water for various wildlife species.

Antelope occasionally use the Heath Lake WSA throughout the year. Deep snow on Steens Mountain may move some wintering deer into the WSA, but deer use is usually light. Chukars are found along rocky rims. One thousand acres of bare soil created by livestock grazing and wind erosion near the east side of Tudor Lake have been proposed for seeding with intermediate wheatgrass, crested wheatgrass and four-wing saltbush to improve wildlife habitat. This project would reestablish ground cover and increase forage primarily for antelope and nongame species.

The Mickey Basin area in the Table Mountain WSA has an abundance of springs, seeps, and wet meadows and contains species not found over most of the rest of this WSA. The Townsend pocket gopher, montane meadow mouse, killdeer and common snipe are common. The playa in the basin is occasionally flooded during the spring and is used by a few migrating shorebirds and waterfowl. Long-eared owls nest in buffaloberry found near springs in the basin.

The rest of the WSA is arid. Chukars and sage grouse are present, but not abundant. Deer and antelope occasionally use the area. The more rugged parts of the area have potential as California bighorn sheep habitat, and ODFW has identified this area for a possible release of bighorns, along with the Sheepshead Mountains WSA.

A proposed project in this area is the Mickey Dike project, designed to utilize water from an existing artesian well within the WSA. Construction of four dikes to capture the water is proposed, creating up to 30 surface acres of wetlands.

In West Peak WSA, yearlong antelope range exists, but most of the use occurs in the winter and spring. Deep snow may force wintering mule deer into the area, but normally deer make little use of the area.

The Palomino Hills WSA is an area of low hills that support wildlife associated with sagebrush/bunchgrass. Antelope and mule deer make incidental use of these hills throughout the year. Upland game birds are uncommon, although a few sage grouse use selected areas during the summer. Two wildlife guzzlers are proposed within the WSA. The guzzlers would enhance habitat for sage grouse, antelope, and mule deer.

The Sulphur Springs area supports wildlife similar to Heath Lake and West Peak WSAs.

Livestock Grazing

Portions of 6 grazing allotments are within the six combined study areas in the Sheepshead group. Table 6 shows the existing and potential livestock use for the WSAs in AUMs (animal unit month, the amount of forage needed to sustain one cow and calf, or equivalent animals, for one month).

Licensed livestock grazing in pastures wholly or partially in the WSAs is proposed to be increased by allocating available forage, including 1,985 AUMs in Sheepshead Mountains and Wildcat Canyon WSAs and 4,420 AUMs in Palomino Hills WSA. (Total increases in the pastures in these WSAs would be 4,420 AUMs since the WSAs share common pastures.) Increases in the WSAs would vary according to the amount of pasture in the WSA and other factors such as terrain and vegetation.

Livestock projects are also proposed within the Sheepshead Mountains group, as follows:

Sheepshead Mountains WSA - 1 well, 2 reservoirs, 6 miles of pipeline, 8 miles of fence, one 18,000-gallon storage tank and 2,500 acres of brush control and seeding in the Pollock allotment; and 2 reservoirs and 1 brush control project totaling 6,500 acres in the Sheepshead allotment.

Wildcat Canyon WSA - 2 brush control projects totaling 2,795 acres in the Alvord allotment; and 5 reservoirs, 1 spring development and 1 brush control project covering 730 acres in the Sheepshead allotment.

Heath Lake WSA - 1 well, 4 miles of pipeline, 7 miles of fence and 2,500 acres of brush control and seeding, all in the Pollock allotment.

Table Mountain WSA - 5 reservoirs and 2,195 acres of brush control, all in the Alvord allotment.

West Peak WSA - 1 mile of pipeline, 2 miles of fence and 2,880 acres of brush control, all in the Mann Lake allotment.

Palomino Hills WSA - 8 reservoirs in the Sheepshead Allotment; and 1 reservoir in the Barren Valley allotment.

These proposed projects would increase forage production and improve livestock management in the Sheepshead Mountains group and could result in a total increase of up to 6,580 AUMs of licensed use among the affected allotments.

No range improvements are proposed in the Sulphur Springs area.

Existing livestock projects in the area include the fencing, seeding, and water developments listed in table 3, Naturalness section.

Table 6. Existing and Potential Livestock Use in the Sheepshead Mountains Group, WSAs OR-2-72C, 72D, 72F, 72I, 72J, 3-114, and Sulphur Springs Area.

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA From Projects (AUMs)[1]	Available but Unallocated Forage in Pastures (AUMs)
Sheepshead Mountains WSA (OR-2-72C)						
Sheepshead (No. 0701)	3,000	04/01 to 10/31	39	1,518	815	1,985
Pollock (No. 6011)	4,760	05/05 to 12/31	24	350	1,165	0
Alvord (No. 6012)	8,803	04/16 to 06/30	1	235	0	0
Total Sheepshead Mountains				2,103	1,980	1,985
Wildcat Canyon WSA (OR-2-72D)						
Sheepshead (No. 0701)	3,000	04/01 to 10/31	30	932	350	1,985
Barren Valley Common (No. 0801)	10,237	11/01 to 03/31	2	20	0	0
Alvord (No. 6012)	8,803	04/16 to 06/30	4	915	750	0
Total Wildcat Canyon				1,867	1,100	1,985
Heath Lake WSA (OR-2-72F)						
Pollock (No. 6011)	4,760	05/05 to 10/31	24	835	1,200	0
Total Heath Lake				835	1,200	0
Table Mountain WSA (OR-2-72I)						
Pollock (No. 6011)	4,760	11/01 to 12/31	6	93	0	0
Alvord (No. 6012)	8,803	04/16 to 06/30	12	1,363	1,150	0
Mann Lake (No. 6026)	3,600	12/01 to 02/28	15	222	0	0
Total Table Mountain				1,678	1,150	0
West Peak WSA (OR-2-72J)						
Mann Lake (No. 6026)	3,600	12/01 to 02/28	21	390	700	0
Total West Peak				390	700	0
Palomino Hills WSA (OR-3-114)						
Sheepshead (No. 0701)	3,000	04/01 to 10/31	25	808	400	1,985
Barren Valley Common (No. 0801)	10,237	11/07 to 03/31	6	474	50	2,435
Total Palomino Hills				1,282	450	4,420
Sulphur Springs Area						
Pollock (No. 6011)	4,760	11/01 to 12/31	9	325	0	0
Alvord (No. 6012)	8,803	12/01 to 04/15	9	325	0	0
Mann Lake (No 6026)	3,600	11/01 to 02/28	2	35	0	0
Total Sulphur Springs Area				685	0	0
Total Sheepshead Mountains Group				8,840	6,580	4,420[2]

[1] Increases might or might not result in increased licensed use in the allotment (see narrative).

[2] Total does not double-count pastures which overlap WSAs.

Motor vehicle use by grazing operators varies among the study areas. All vehicle use is for livestock management, including livestock supervision, salting and hauling water or horses. In the West Peak WSA, the boundary roads are used heavily by grazing operators, with no use within the study area. In the other five study areas and the Sulphur Springs area, the motor vehicle use is similar. The boundary roads are used heavily, while the interior roads and ways are used slightly to moderately. Livestock are managed from horseback within the study areas.

Recreation Use

Recreation use in the Sheepshead Mountains group is minimal. Game species which can be hunted are mule deer, antelope, sage grouse and chukar. However, due to water limitations, animal populations are low and widely scattered, resulting in poor quality hunting. Most of the hunting for deer and antelope within the Sheepshead group occurs in the Table Mountain WSA due to the greater availability of water in Mickey Basin. Sage grouse were hunted in the fall of 1983, but it is not known how much hunting occurred.

Hunters and other recreationists use vehicles as their primary access in the area. The only restrictions on off-road-vehicle (ORV) use occur in the Palomino Hills WSA, where use is restricted to existing roads and ways in the Saddle Butte Lava Field. All other areas are open to ORV use.

These study areas currently receive little primitive recreation associated with day hiking, backpacking and sightseeing.

Economic Value and Local Income

Livestock grazing, oil and gas and geothermal leasing, and recreation are the only resource outputs which generate economic activity in these WSAs. As of January 1, 1984 there were 15 oil and gas leases and 7 geothermal leases on this group of six WSAs.

Economic value and local personal income generated from existing levels of resource outputs of these lands are presented in tables 7a-g. Table 7a shows amounts for the entire Sheepshead Mountains Group combined and the other tables show data for individual WSAs within the group. The only resource output generating economic

Table 7a. Economic Value and Local Personal Income Generated Annually, Existing Program, Sheepshead Mountains Group, WSAs OR-2-72C, 72D, 72F, 72I, 72J, and 3-114 Combined (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	8,840	$ 66,653	$103,550
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil and Gas Leases	Acres	33,221	33,221	10,004
Geothermal Leases	Acres	7,926	14,762	4,446
Total			$114,636	$118,000

Table 7b. Economic Value and Local Personal Income Generated Annually, Existing Program, Sheepshead Mountains WSA (OR-2-72C) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	2,103	$15,857	$17,602
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil & Gas Leases	Acres	3,700	3,700	1,114
Total			$19,557	$18,716

Table 7c. Economic Value and Local Personal Income Generated Annually, Existing Program, Wildcat Canyon WSA (OR-2-72D) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	1,867	$14,077	$30,021
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown

Table 7d. Economic Value and Local Personal Income Generated Annually, Existing Program, Heath Lake WSA (OR-2-72F) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	835	$ 6,296	$6,989
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil & Gas Leasing	Acres	4,695	4,695	1,414
Total			$10,991	$8,403

Table 7e. Economic Value and Local Personal Income Generated Annually, Existing Program, Table Mountain WSA (OR-2-72I) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	1,678	$12,652	$14,045
Recreation	RVD	Unknown	Unknown	Unknown
Oil & Gas Leases	Acres	18,000	18,000	5,421
Geothermal	Acres	7,376	14,212	4,280
Total			$44,864	$23,746

Table 7f. Economic Value and Local Personal Income Generated Annually, Existing Program, West Peak WSA (OR-2-72J) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	390	$ 2,940	$3,264
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil & Gas Leases	Acres	6,826	6,826	2,055
Geothermal Leases	Acres	550	550	166
Total			$10,316	$5,485

Table 7g. Economic Value and Local Personal Income Generated Annually, Existing Program, Palomino Hills WSA (OR-3-114) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	1,967	$14,831	$31,629
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown

activity in the Sulphur Springs area (proposed to be added under the enhanced wilderness alternative) is livestock grazing. The AUMs associated with this grazing have been included in the livestock AUMs for Palomino Hills WSA, table 7g. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add six separate wilderness areas totaling 201,000 acres to the National Wilderness Preservation System (NWPS): 51,120 acres in the Sheepshead Mountains WSA, 32,720 acres in the Wildcat Canyon WSA, 20,100 acres in the Heath Lake WSA, 38,600 acres in the Table Mountain WSA, 7,900 acres in the West Peak WSA, and 50,560 acres in the Palomino Hills WSA.

The wilderness areas would include the steep escarpments, ridges and uplifted plateau which form the Sheepshead Mountains themselves, and the drainages which cut through them. This includes the prominent north-south Sheepshead Ridge and the Heath Creek drainage in the Sheepshead Mountains WSA; the 400 to 600-foot deep canyons of Wildcat, Mickey and Bone Creeks in the Wildcat Canyon WSA; a long north-south ridge with a steep east-facing escarpment and two intermittent playas, Heath Lake and South Lake, in the Heath Lake WSA; Table Mountain, a large flat-topped mesa with steep, rocky escarpments, Mickey Basin, a playa surrounded by springs and seeps and escarpments, in the Table Mountain WSA; a ridgeline and peak in the West Peak WSA; the 400- to 700-foot-deep canyons of Palomino and Antelope Creeks and a portion of the Saddle Butte Lava Field in the Palomino Hills WSA.

Wilderness designation under this alternative would maintain or improve the natural qualities of these areas as well as the outstanding opportunities for solitude and primitive recreation. Closure of 55 vehicle ways totaling 117 miles throughout the six WSAs would improve the naturalness of the area by eliminating most vehicle use and allowing the ways to revegetate. The ways might continue to be used on a limited basis for livestock management if there were no practical alternatives. However, if such use did occur it would be relatively minor, and revegetation would still occur.

Closing the ways would also improve the opportunities for solitude and the quality of primitive recreation by reducing disturbances from motor vehicles. With the continued use of boundary and dead-end roads, such disturbance would not be entirely eliminated.

Access to inholdings by landowners might also involve the use of vehicles on ways, if it were a necessary means of access. Such continued use of vehicles, depending on the amount, could adversely affect solitude. It might also affect the naturalness of the area by not allowing ways to revegetate.

Designating the six WSAs as wilderness under the all wilderness alternative would also preserve the special wilderness features in their present condition. This includes the plant species of special interest in Sheepshead Mountains, Heath Lake, Table Mountain, and Palomino Hills WSAs, raptor habitat in Sheepshead Mountains, Table Mountain, and West Peak WSAs, the potential bighorn sheep habitat in Sheepshead Mountains and Table Mountain WSAs, and the kit fox habitat in Wildcat Canyon and Palomino Hills WSAs. Scenic quality in Heath Lake and West Peak WSAs would also be protected.

The possibility of surface disturbing activities such as mineral development would be nearly eliminated. Development on a geothermal lease on less than 500 acres in the Table Mountain WSA could occur under wilderness designation and could adversely affect wilderness values on this small area. Wilderness values on surrounding public lands also could be adversely affected if mineral development occurred on private and split-estate inholdings. Construction of facilities on the inholdings and access to the inholdings could reduce the apparent naturalness of adjacent lands. Opportunities for solitude and the quality of primitive recreation could be affected by increased human activity and vehicle disturbance.

The **enhanced wilderness alternative** would combine the entire areas of all six WSAs into a single wilderness area and add 231,870 acres to the National Wilderness Preservation System, assuming acquisition of 15,670 acres of private and split-estate inholdings and boundary parcels and addition of the 15,200 acres of public land in the Sulphur Springs area.

In addition to protecting wilderness values in the six WSAs, as would be the case in the all wilderness alternative, the enhanced alternative would preserve the Sulphur Springs area, which contains a large basin with a perennial spring surrounded by steep escarpments.

Acquisitions of private and split-estate land would prevent the possible development of these parcels, as well as the need for access, maintaining naturalness of the study areas.

Closing 96 miles of boundary and dead-end roads (along with the vehicle ways), to combine the WSAs and Sulphur Springs area, would eliminate vehicle use in the area and prevent the possibility of vehicle intrusions on solitude. With the acquisition of inholdings, there would be no need for access to them, further enhancing the solitude of the area. The road and way closures would enhance naturalness by reducing the opportunity for off-road vehicle use and the resulting surface disturbance. The closure of the roads would also improve the natural quality of the area by allowing the roads to revegetate and become less noticeable.

The **preferred alternative** would combine all or part of three WSAs into one wilderness and add 106,155 acres to the NWPS, assuming acquisition of 5,775 acres of private and split-estate inholding and boundary parcels. The combined area would include 43,160 acres of Sheepshead Mountains WSA, all 32,720 acres of the Wildcat Canyon WSA and 24,500 acres of the Table Mountain WSA.

Acquisition of private and split-estate inholdings and boundary parcels would preclude potential development of these inholdings from adversely affecting the areas' wilderness values.

As with the all and enhanced wilderness alternatives, the wilderness values and special features associated with the area recommended as suitable for wilderness would be preserved in their present condition. This would include all of Wildcat Canyon WSA and the major portions of Sheepshead Mountains and Table Mountain WSAs. These parts of the WSAs retain basic wilderness characteristics, being in a natural condition and having outstanding opportunities for solitude.

The wilderness under this alternative would include representations of most of the special wilderness features in the Sheepshead Mountains, including potential bighorn sheep habitat, areas of raptor use, and kit fox habitat and most of the plant species of interest.

Closure of 62 miles of ways (30 in the Sheepshead Mountains WSA, 20 in the Wildcat Canyon WSA and 12 in the Table Mountain WSA) and 29.5 miles of roads would enhance the naturalness of the area and improve opportunities for solitude and primitive recreation.

Wilderness values and special features identified in the Heath Lake, West Peak and Palomino Hills WSAs, or within the portions of Sheepshead Mountains and Table Mountain WSAs recommended as nonsuitable, would not be protected and could be subject to disturbance from resource uses not compatible with wilderness.

Proposed range and wildlife projects would be developed in portions recommended as nonsuitable for wilderness, and some of the projects would adversely affect the naturalness of the area. They include 2,500 acres of brush control and grass seeding and 1,000 acres of grass and four-wing salt-bush seeding in the Heath Lake WSA, 2,880 acres of brush control in the West Peak WSA, and the creation of 30 acres of wetland in the Mikey Basin area of the Table Mountain WSA.

Potential energy and mineral development could adversely affect the naturalness of the nonsuitable areas, reduce opportunities for solitude and recreation, and reduce the areas' special wilderness features. This is important since the entire area has moderate potential for occurrence of oil and gas and the portion of Table Mountain recommended as nonsuitable, as well as part of West Peak WSA, have a high potential for geothermal resources.

Scenic values, including those in areas identified as having outstanding scenic quality, could be adversely affected by range or mineral developments. The proposed brush control and seeding in West Peak WSA would be developed in an area with outstanding scenic quality. Developments in the nonsuitable areas might be visible from the higher portions of the area recommended as suitable for wilderness in the Sheepsheads. Other special wilderness features which could be adversely affected include potential bighorn sheep habitat, and areas of raptor use.

Opportunities for solitude and the quality of primitive recreation activities could be adversely affected within the areas not designated as wilderness as a result of energy and mineral developments. This would be especially true in areas where new mineral development could result in increased human activity and the need for increased access to development sites. This could also affect the opportunities for solitude and the quality of primitive recreation opportunities within the area recommended suitable as wilderness.

Under all of the alternatives, the wild horse herds would be maintained at levels determined appropriate in BLM's herd management area plans. Wild horse herd numbers regularly increase, and it would be necessary to gather horses in order to keep the vegetative condition from rapidly deteriorating. This could have a minor adverse effect on wilderness values. The Sheepshead Mountains WSA contains a 3-acre trap site which is the only feasible site to gather horses from the Sheepshead horse herd. Under wilderness designation, the effects of periodic horse gatherings (approximately every four years) would be the same. The trap would be dismantled after each gathering but adverse effects to the naturalness of the area would be evident due to trampled vegetation, denuded areas, and vehicle tracks. During gatherings, the use of helicopter and trap construction would temporarily affect wilderness solitude.

Under the **no wilderness/no action alternative**, wilderness values and special features in the six WSAs would be subject to disturbance from proposed livestock or wildlife developments, as well as possible energy or mineral development.

Effects of this alternative on specific wilderness values would be similar to those for the nonsuitable portions under the preferred alternative.

However, all of the study areas would be open to potential mineral development and all proposed livestock and wildlife improvements would be allowed. Naturalness, opportunities for solitude and the quality of primitive recreation could all be adversely affected by disturbances from mineral or range developments.

Some of the areas' important special features such as potential bighorn sheep habitat or raptor use areas could be adversely affected by mineral development within the central portions of the Sheepshead Mountains or Table Mountain WSAs. This would depend on the location and extent of development.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development. Table 8 shows the acres that would be withdrawn under each alternative, including the acreages rated high and moderate for minerals.

Table 8. Effects of Alternatives on Energy and Mineral Development, Sheepshead Mountains Group, WSAs OR-2-72C, 72D, 72F, 72I, 72J, and 3-114, and Sulphur Springs Area.

	Acres Withdrawn								
	All Wilderness						Enhanced Wilderness	Preferred	No Wilderness/ No Action
	Sheepshead Mountains (2-72C)	Wildcat Canyon (2-72D)	Heath Lake (2-72F)	Table Mountain (2-72I)	West Peak (2-72J)	Palomino Hills (3-114)	(6 WSAs combined)	(3 WSAs combined)	(All 6 WSAs)
Total area	51,120	32,720	20,100	38,600	7,900	50,560	216,200[1]	100,380[2]	0
Oil and Gas rated moderate	51,120	32,720	20,100	38,600	7,900	50,560	216,200	100,380	0
Geothermal rated moderate	0	7,680	0	11,880	6,675	0	26,235	16,700	0
Geothermal rated high	0	0	0	12,960	1,230	0	14,190	1,280	0
Metals rated moderate	700	1,480	590	2,700	3,300	0	8,770	2,180	0
Diatomite rated moderate	4,520	80	960	890	340	6,690	13,480	4,200	0
Zeolites rated moderate	1,300	0	0	0	0	6,690	7,990	900	0

[1] Includes 15,200 acres of public land (Sulphur Springs area) proposed to be added under this alternative. Development also precluded on an additional 15,670 acres if private and split-estate land is acquired, as proposed under this alternative.

[2] Development also precluded on an additional 5,775 acres if private and split-estate land is acquired, as proposed under this alternative.

Effects on Vegetation

Areas designated wilderness would not be subject to most surface disturbing activities. Vegetation dependent upon the existing undeveloped environment would thus be maintained.

Under the **preferred alternative**, 2,500 acres of brush control and seeding to crested wheatgrass in the Heath Lake WSA and 2,880 acres of brush control in the West Peak WSA would occur in the areas recommended nonsuitable. Additionally, under the **no wilderness/no action alternative**, 6,500 acres of brush control and 2,500 acres of brush control and seeding to crested wheatgrass in Sheepshead Mountains WSA, 3,525 acres of brush control in Wildcat Canyon WSA, and 2,195 acres of brush control in Table Mountain WSA would occur.

The brush control projects are designed to reduce shrub cover, particularly sagebrush. This cover reduction releases grasses from competition and increases their density. This would temporarily change the vegetative composition from shrubs and forbs to grasses and reduce vegetation diversity and could also set back the seral stage and increase the successional rate. Areas seeded would convert to crested wheatgrass, a non-native species.

The federal candidate species of special interest would receive the same protection as federally listed threatened or endangered species. The ONHP species of special interest would not be formally protected and would thus be subject to disturbance in areas recommended nonsuitable. However, the ONHP species could be designated as a BLM sensitive species and as such would receive the same protection as the federal candidate species.

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness.

Wilderness designation under either the **all wilderness or enhanced wilderness alternative** would increase the likelihood that ODFW would reintroduce native California bighorn sheep.

Although there are no proposed wildlife projects to benefit bighorn sheep, water sources might need to be developed to insure that a reintroduction would be successful. Ordinarily, the development of water sources would not be consistent with wilderness management which allows natural processes to operate without interference. However, such developments might be appropriate where they would correct the effects of man's influence. This might be the case with water developments for bighorn sheep in the Sheepshead Mountains WSA and the Table Mountain WSA.

The area recommended suitable under the **preferred alternative** is smaller than under the all wilderness alternative, but the protection afforded could be enough to favor the reintroduction of bighorns.

Under the all and enhanced wilderness alternatives, the proposed wildlife project involving construction of dikes in Mickey Basin would be precluded. The creation of 30 acres of wetlands for aquatic birds and other species would be foregone. Under the preferred alternative and no wilderness/no action alternative, this project would be constructed.

The all and enhanced alternatives might also preclude the development of 5 proposed wildlife guzzlers. These might be appropriate in wilderness, because they would correct the adverse effect of man's influence. A site-specific assessment would be prepared to determine if they conform with Wilderness Management Policy. If they were not allowed, possible increases in the population and distribution of upland game birds, and to a lesser extent big game animals, would be foregone. Under the preferred alternative, three of the guzzlers might be precluded. All five guzzlers would be built under the no wilderness/no action alternative.

Under the all and enhanced wilderness alternatives, the proposed wildlife seeding of 1,000 acres on the west side of Heath Lake WSA would be precluded and the barren area would revegetate slowly. This project would be allowed under the preferred alternative and no wilderness/no action alternative which would reestablish wildlife habitat for antelope and non-game species relatively quickly.

Proposed livestock improvements, particularly reservoirs and other water sources, could have substantial benefits for wildlife. These projects might or might not be allowed under the all and enhanced wilderness alternatives, depending on a site-specific assessment of whether they conform with Wilderness Management Policy. Proposed brush control projects would also benefit antelope. These projects would not be allowed under the all and enhanced wilderness alternatives, but some would be allowed under the preferred alternative. Brush control and seeding to crested wheatgrass creates herbaceous vegetation beneficial to antelope. These projects and their associated water developments would increase habitat in the area, possibly increasing numbers of antelope and other wildlife species.

Under the **no wilderness/no action alternative**, the proposed wildlife and livestock developments would be constructed and would result in improved distribution and possible population increases for sage grouse, chukar, deer and antelope. The proposed dikes in Mickey Basin would provide wetlands where none currently exists. Aquatic birds and other species associated with wetlands would benefit. Potential (but unplanned) resource development could be detrimental to the reintroduction of bighorn sheep.

Effects on Livestock Grazing

Since increases in licensed use through allocation of available forage might not be allowed under Wilderness Management Policy, all increases in pastures partially in areas recommended suitable might be foregone under the **all wilderness, enhanced wilderness and preferred alternatives**. Thus increases foregone within these pastures under the all wilderness, enhanced wilderness and preferred alternatives would range from 0 to 1,985 AUMs in the Sheepshead Mountains and Wildcat Canyon WSAs and from 0 to 4,420 in the Palomino Hills WSA. Total potential increases foregone in all three WSAs from the all wilderness, enhanced wilderness and preferred alternatives would be from 0 to 4,420 AUMs, since these WSAs have common pastures.

Increases foregone within pastures under the preferred alternative would range from 0 to 1,985 AUMs in the Sheepshead Mountains, Wildcat Canyon and Palomino Hills WSAs. Total potential increases foregone in all three WSAs from the preferred alternative would be from 0 to 1,985 AUMs, since the suitable areas in these WSAs share a common pasture. Increases in one pasture from allocating 2,435 AUMs of available forage would be realized in the Palomino Hills WSA under the preferred alternative.

Under the all and enhanced wilderness alternatives, all of the proposed vegetation manipulation projects would be precluded. The affected projects, their benefit/cost (B/C) ratios, and the associated forage production (in AUMs) foregone are:

Sheepshead Mountains WSA - 6,500 acres of brush control (for release) with a B/C ratio greater than 1:1; and 2,500 acres of brush control and seed with B/C ratio less than 1:1, 1,215 AUMs;

Wildcat Canyon WSA - 3,525 acres of brush control (for release) with B/C ratio greater than 1:1, 280 AUMs;

Heath Lake WSA - 2,500 acres of brush control and seed with B/C ratio less than 1:1, 500 AUMs;

Table Mountain WSA - 2,195 acres of brush control (for release) with B/C ratio less than 1:1, 130 AUMs; and

West Peak WSA - 2,880 acres of brush control (for release) with B/C ratio greater than 1:1, 350 AUMs.

The proposed brush control and seed areas in the Sheepshead Mountains and Heath Lake WSAs are actually one project and the associated structural developments would also be precluded under the all and enhanced wilderness alternatives, including 1 well, 1 storage tank, 10 miles of pipeline and 15 miles of fence.

The remaining structural developments outside the proposed brush control and seed areas might or might not be implemented under the all and enhanced wilderness alternatives, depending on a site-specific assessment of whether they conform with Wilderness Management Policy. If not allowed under wilderness, the opportunity to increase forage production through improved management systems would be foregone. The projects, their B/C ratios, and the associated AUMs which may be foregone under the all and enhanced wilderness alternatives are:

Sheepshead Mountains WSA - 4 reservoirs with B/C ratio greater than 1:1, 765 AUMs;

Wildcat Canyon WSA - 5 reservoirs and one spring development with B/C ratio greater than 1:1, 820 AUMs;

Heath Lake WSA - 1 well with B/C ratio greater than 1:1, 700 AUMs;

Table Mountain WSA - 5 reservoirs with B/C ratio greater than 1:1, 1,020 AUMs;

West Peak WSA - 1 mile of pipeline and 2 miles of fence with B/C ratio greater than 1:1, 350 AUMs;

Palomino Hills WSA - 9 reservoirs with B/C ratio greater than 1:1, 450 AUMs.

Overall, if both the vegetative manipulations and the structural developments were not permitted, the opportunity to increase licensed livestock use by up to 6,580 AUMs would be foregone.

Under the preferred alternative, the following vegetative manipulation projects would be foregone:

Sheepshead Mountains WSA - 6,500 acres of brush control (for release) and 2,500 acres of brush control and seed with a potential increase in livestock forage of 1,215 AUMs. The structural developments associated with the 2,500 acres of brush control and seed in the Sheepshead Mountains WSA would also be precluded under this alternative, including 1 well, 1 storage tank, 6 miles of pipeline and 8 miles of fence;

Wildcat Canyon WSA - 3,525 acres of brush control (for release) with 280 AUMs;

Table Mountain WSA - 2,195 acres of brush control (for release) with 130 AUMs;

The remaining structural developments outside the proposed brush control and seed that might or might not be developed under the preferred alternative (depending on a site-specific assessment of whether they conform with Wilderness Management Policy) include:

Sheepshead Mountains WSA - 4 reservoirs with 765 AUMs;

Wildcat Canyon WSA- 5 reservoirs and one spring development with 820 AUMs; and

Table Mountain WSA - 5 reservoirs with 1,020 AUMs.

If none of the structural projects were allowed under the preferred alternative, the opportunity to increase licensed livestock use by up to 2,605 AUMs would be foregone.

Under the **no wilderness/no action alternative**, all of the proposed improvements including pipelines, wells, spring developments, reservoirs, and vegetative manipulations would be implemented, making additional forage available in the study areas. Also, an allocation of 1,985 AUMs of available forage in pastures in the Sheepshead Mountains and Wildcat Canyon WSAs and 4,420 AUMs in the Palomino Hills WSA would be realized. (Total increases in the pastures in these WSAs would be 4,420 AUMs since the WSAs share common pastures.)

Under all of the alternatives the forage produced from the proposed projects (up to 6,580 AUMs in the Sheepshead Mountains group as a whole) may be licensed if it is sustainable and all forage needs in the allotment have been considered.

The proposed road closures under the enhanced wilderness and preferred alternatives could be a serious inconvenience to the grazing operators. The roads that divide the individual study areas, and some interior ways and roads, are used often for general management of livestock, and access by motor vehicle is very important. A limited amount of vehicle use by livestock operator for maintenance of grazing facilities or management of livestock would be allowed if it were determined that there was no practical alternative.

Closing only the ways under the all wilderness alternative in all study areas would be somewhat inconvenient to livestock operators. Much of the grazing management could be accomplished without motor vehicles under this alternative.

Effects on Recreation Use

The quality of and opportunities for primitive recreation in the six WSAs would be maintained at their present level or improved under the **all wilderness alternative**. Improvements in the quality of primitive recreation would be a result of eliminating use on vehicle ways in the six WSAs.

This alternative would generally result in a reduction of vehicle-oriented recreation. Some of the reduction in vehicle-oriented recreation would be offset by an increase in primitive recreation resulting from wilderness designation. Overall recreation use would decrease slightly.

The effects of the **enhanced wilderness alternative** are the same as all wilderness, except that closing 96 miles of boundary roads, which separate the WSAs, plus the vehicle ways would eliminate vehicle recreation and increase the opportunities for high quality primitive recreation.

Under the **preferred alternative**, effects on recreation for the lands recommended as suitable for wilderness would be the same as in the all and enhanced wilderness alternatives.

In areas recommended nonsuitable, primitive recreation would be subject to a reduction in quality. Possible disturbances from proposed range improvements or other developments could have an adverse impact on the quality of primitive recreation.

Because of the vehicle restrictions in the all wilderness, enhanced wilderness and preferred alternatives, it is expected that the overall recreational use of the six WSAs would decline. Little primitive recreation is occurring at the present time in the six WSAs. However, it is thought that the area has sufficient attractions that wilderness designation would result in increased primitive recreation use. Any expected increase in primitive recreation use would not be sufficient to offset the reduction in vehicle-oriented recreation.

Under the **no wilderness/no action alternative**, primitive recreation would be subject to continued disturbances by existing vehicle access routes and use. Primitive recreation would further be disturbed by proposed range improvement projects. However, vehicle-oriented recreation could benefit from additional access provided by the development of range improvements. Hunting opportunities could also be improved as the proposed wildlife and livestock improvements could result in an increase in some game populations through improved habitat and better water distribution. No significant impact to overall recreation is expected.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 9a-g and 10a-g. Tables 9a-g show the effects on economic value and tables 10a-g, the effects on local personal income. It is not known at this time whether individual proposed structural developments would be constructed if the area were designated wilderness; nor is it known if the grazing increases would be allowed. It is known that vegetative manipulation projects would not be allowed.

Currently, vehicles are used for livestock management in the study area. The all wilderness, enhanced wilderness and preferred alternatives would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operators in the WSA would be an increase in cost of about $1,215 per year.

The column for the all wilderness, enhanced wilderness, and preferred alternatives shows the effects as a range of values dependent upon whether structural improvements, grazing operator access, and/or grazing adjustments were allowed.

Table 9a. Effects of Alternatives on Annual Economic Value, Sheepshead Mountains Group, WSAs OR-2-72C, 72D, 72F, 72I, 72J, and 3-114 Combined (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Adjustment [1]	AUM	0 to +4,420	+2,435 to +4,420	+4,420
Investment [2]	AUM	0 to +4,105	+2,350 to +4,955	+6,580
Big game hunting [3]	RVD	0 to +29	+15 to +37	+75
Upland game hunting [3]	RVD	0 to +34	+9 to +35	+39
Fishing [3]	RVD	0 to +99	+56 to +99	+99
Oil and Gas Leases	Acres	-33,221	-27,983	0
Geothermal Leases	Acres	-7,926	-7,926	0
VALUE OF PLANNED INVESTMENTS [4]				
Grazing	$	0 to +30,952	+17,719 to +37,361	+49,613
Big game hunting	$	0 to +658	+340 to +839	+1,701
Upland game hunting	$	0 to +1,065	+282 to +1,096	+1,222
Fishing	$	0 to +2,386	+1,350 to +2,386	+2,386
Total [5]	$	0 to +35,061	+19,691 to +41,682	+54,922
Investments [6]	$	0 to -12,300	-15,066 to -22,441	-36,864
Net Economic Value	$	0 to +22,761	+4,625 to +19,241	+18,058
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Grazing:				
Adjustments	$	0 to +33,327	+18,360 to +33,327	+29,964
Reduced access [7]	$	-1,215	-985	0
Oil and Gas Leases	$	-33,221	-27,986	0
Geothermal Leases	$	-14,762	-14,762	0
Total	$	-49,198 to -15,871	-25,378 to -10,406	+46,552
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	-49,198 to +6,890	-20,748 to +8,835	+51,385

[1] Adjustments to use currently available but unallocated livestock forage.

[2] Expected future increases due to range improvement investments.

[3] Expected future increases due to proposed projects.

[4] A vegetative manipulation project involving up to $286,894 total expenditures, and structural projects involving $156,800. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[5] Detail may not sum to "Total" due to rounding.

[6] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[7] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 9b. Effects of Alternatives on Annual Economic Value, Sheepshead Mountains WSA (OR-2-72C) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness, Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Adjustments [1]	AUM	0 to +1,985	+1,985
Investment [2]	AUM	0 to +765	+1,980
Big game hunting [3]	RVD	0 to +13	+19
Upland game hunting[3]	RVD	0 to +15	+15
Fishing [3]	RVD	0 to +12	+12
Oil and Gas Leases	Acres	-3,700	0
VALUE OF PLANNED INVESTMENTS [4]			
Grazing	$	0 to +5,768	+14,929
Big game hunting	$	0 to +295	+431
Upland game hunting	$	0 to +470	+470
Fishing	$	0 to +289	+289
Total [5]	$	0 to +6,822	+16,119
Investments [6]	$	0 to -2,260	-13,261
Net Economic Value	$	0 to +4,562	+2,858
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS			
Grazing:			
Adjustments	$	0 to +14,967	+14,967
Reduced access [7]	$	-442	0
Oil and Gas Leases	$	-3,700	0
Total	$	-4,142 to +10,825	+14,967
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS			
All categories	$	-4,142 to +15,387	+17,825

[1] Adjustments to use currently available but unallocated livestock forage.

[2] Expected future increases due to range improvement investments.

[3] Expected future increases due to proposed projects.

[4] Vegetative manipulation projects involving up to $136,550 total expenditures, and structural projects involving up to $26,000. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[5] Detail may not sum to "Total" due to rounding.

[6] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[7] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 9c. Effects of Alternatives on Annual Economic Value, Wildcat Canyon WSA (OR-2-72D) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness, Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Adjustments [1]	AUM	0 to +1,985	+1,985
Investment [2]	AUM	0 to +820	+1,100
Big game hunting [3]	RVD	0 to +9	+28
Upland game hunting [3]	RVD	0 to +11	+13
Fishing [3]	RVD	0 to +31	+31
VALUE OF PLANNED INVESTMENTS [4]			
Grazing	$	0 to +6,183	+8,294
Big game hunting	$	0 to +204	+635
Upland game hunting	$	0 to +344	+407
Fishing	$	0 to +747	+747
Total [5]	$	0 to +7,478	0 to+ 10,083
Investments [6]	$	0 to -2,658	-4,665
Net Economic Value	$	0 to +4,820	+5,418
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS			
Grazing:			
Adjustments	$	0 to +14,967	+14,967
Reduced access [7]	$	-117	0
Total	$	-117 to +14,850	+14,967
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS			
All categories	$	-117 to +19,670	+20,385

[1] Adjustments to use currently available but unallocated livestock forage.
[2] Expected future increases due to range improvement investments.
[3] Expected future increases due to proposed projects.
[4] Vegetative manipulation projects involving up to $24,914 total expenditures, and structural projects involving up to $31,900. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[5] Detail may not sum to "Total" due to rounding.
[6] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.
[7] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 9d. Effects of Alternatives on Annual Economic Value, Heath Lake WSA (OR-2-72F) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +700	+1,200	+1,200
Big game hunting	RVD	0	+6	+6
Oil and Gas Leases	Acres	-4,695	-4,695	0
VALUE OF PLANNED INVESTMENTS [2]				
Grazing	$	0 to +5,278	+9,048	+9,048
Big game hunting	$	0	+136	+136
Total [3]	$	0 to +5,278	+9,184	+9,184
Investments [4]	$	0 to -967	-8,375	-8,375
Net Economic Value	$	0 to +4,311	+809	+809
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Reduced access [5]	$	-80	0	0
Oil and Gas Leases	$	-4,695	-4,695	0
Total	$	-4,775	-4,695	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	-4,775 to -464	-3,886	+809

[1] Expected future increases due to range improvement investments.

[2] A vegetative manipulation project involving $81,950 total expenditures, and structural projects involving $12,000. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Detail may not sum to "Total" due to rounding.

[4] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[5] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 9e. Effects of Alternatives on Annual Economic Value, Table Mountain WSA (OR-2-72I) (1981 price levels)

Item	Unit of Measure	All Wilderness Enhanced Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +1,020	0 to +1,020	+1,150
Big game hunting [2]	RVD	0	0	+13
Upland game hunting [2]	RVD	0	0	+2
Oil and Gas leases	Acres	-18,000	-12,765	0
Geothermal leases	Acres	-7,376	-7,376	0
VALUE OF PLANNED INVESTMENTS [3]				
Grazing	$	0 to +7,691	0 to +7,691	+8,671
Big game hunting	$	0	0	+295
Upland game hunting	$	0	0	+63
Total [4]	$	0 to +7,691	0 to +7,691	+9,029
Investments [5]	$	0 to -1,813	0 to -2,457	-3,872
Net Economic Value	$	0 to +5,878	0 to +5,234	+5,157
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Reduced access [6]	$	-426	-426	0
Geothermal Leases	$	-14,212	-14,212	0
Oil and Gas leases	$	-18,000	-12,765	0
Total	$	-32,638	-27,403	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	-32,638 to -26,760	-27,403 to -22,169	+5,157

[1] Expected future increases due to range improvement investments.

[2] Expected future increases due to proposed projects.

[3] A vegetative manipulation project involving $17,560 total expenditures, and structural projects involving $30,500. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Detail may not sum to "Total" due to rounding.

[5] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[6] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 9f. Effects of Alternatives on Annual Economic Value, West Peak WSA ((OR-2-72J) (1981 price levels)

Item	Unit of Measure	All Wilderness Enhanced Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +350	+700	+700
Big game hunting [2]	RVD	0 to +1	+3	+3
Upland game hunting [2]	RVD	0	+1	+1
Oil and Gas leases	Acres	-6,826	-6,826	0
Geothermal leases	Acres	-550	-550	0
VALUE OF PLANNED INVESTMENTS [3]				
Grazing	$	0 to +2,639	+5,278	+5,278
Big game hunting	$	0 to +23	+68	+68
Upland game hunting	$	0	+31	+31
Total [4]	$	0 to +2,662	+5,377	+5,377
Investments [5]	$	0 to -741	-2,830	-2,830
Net Economic Value	$	0 to +1,921	+2,547	+2,547
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Oil and Gas Leases	$	-6,826	-6,826	0
Geothermal Leases	$	-550	-550	0
Total	$	-7,376	-7,376	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All Categories	$	-7,376 to -5,455	-4,829	+2,547

[1] Expected future increases due to range improvement investments.

[2] Expected future increases due to proposed projects.

[3] A vegetative manipulation project involving $25,920 total expenditures, and structural projects involving up to $9,200. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Detail may not sum to "Total" due to rounding.

[5] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

Table 9g. Effects of Alternatives on Annual Economic Value, Palomino Hills WSA (OR-3-114) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Adjustments [1]	AUM	0 to +4,420	+2,435 to +4,420	+4,420
Investment [2]	AUM	0 to +450	+450	+450
Big game hunting [3]	RVD	0 to +6	+6	+6
Upland game hunting [3]	RVD	0 to +8	+8	+8
Fishing [3]	RVD	0 to +56	+56	+56
VALUE OF PLANNED INVESTMENTS [4]				
Grazing	$	0 to +3,393	+3,393	+3,393
Big game hunting	$	0 to +136	+136	+136
Upland game hunting	$	0 to +251	+251	+251
Fishing	$	0 to +1,350	+1,350	+1,350
Total [5]	$	0 to +5,130	+5,130	+5,130
Investments [6]	$	0 to -3,861	-3,861	-3,861
Net Economic Value	$	0 to +1,269	+1,269	+1,269
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Grazing:				
Adjustments	$	0 to +33,327	+18,360 to +33,327	+33,327
Reduced access [7]	$	-150	0	0
Total	$	-150 to +33,177	+18,360 to +33,327	+33,327
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	-150 to +34,446	+19,629 to +34,596	+34,596

[1] Adjustments to use currently available but unallocated livestock forage.

[2] Expected future increases due to range improvement investments.

[3] Expected future increases due to proposed projects.

[4] Expenditures for structural projects involving up to $47,200, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[5] 5/ Detail may not sum to "Total" due to rounding.

[6] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[7] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 10a. Effects of Alternatives on Local Personal Income, Sheepshead Mountains Group, WSAs OR-2-72C, 72D, 72F, 72I, 72J, and 3-114 Combined (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Adjustment [1]	AUM	0 to +4,420	+2,435 to +4,420	+4,420
Investment [2]	AUM	0 to +4,105	+2,350 to +4,955	+6,580
Big game hunting [3]	RVD	0 to +29	+15 to +37	+75
Upland game hunting [3]	RVD	0 to +34	+9 to +35	+39
Fishing [3]	RVD	0 to +99	+56 to +99	+99
Oil and Gas Leases	Acres	-33,221	-27,983	0
Geothermal Leases	Acres	-7,926	-7,926	0
INCOME FROM PROPOSED INVESTMENTS [4]				
Grazing	$	0 to +14,154	+23,140 to +51,268	+67,027
Big game hunting	$	0 to +266	+141 to +346	+697
Upland game hunting	$	0 to +483	+121 to +498	+555
Fishing	$	0 to +1,164	+661 to +1,164	+1,164
Construction activity [5]	$	0 to +20,290	+25,129 to +37,166	+61,250
Total [6]	$	0 to +46,067	+24,063 to +53,276	+69,443
INCOME FROM OTHER EXPECTED OUTPUT CHANGES				
Grazing:				
Adjustments	$	0 to +71,074	+39,155 to +71,074	+71,074
Oil and Gas Leases	$	-10,004	-8,427	0
Geothermal Leases	$	-4,446	-4,446	0
Total	$	-14,450 to +56,624	+25,282 to +58,201	+71,074
INCOME FROM ALL OUTPUT CHANGES				
All categories [6]	$	-14,450 to +102,691	+49,345 to +111,477	+140,517

[1] Adjustments to utilize currently available but unallocated livestock forage.

[2] Expected future increases due to range improvement investments.

[3] Expected future increases due to proposed projects.

[4] A vegetative manipulation project involving up to $286,894 total expenditures, and structural projects involving $156,800. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[5] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[6] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 5.

Table 10b. Effects of Alternatives on Local Personal Income, Sheepshead Mountains WSA (OR-2-72C) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness, Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Adjustments [1]	AUM	0 to +1,985	+1,985
Investment [2]	AUM	0 to +765	+1,980
Big game hunting [3]	RVD	0 to +13	+19
Upland game hunting [3]	RVD	0 to +15	+15
Fishing [3]	RVD	0 to +12	+12
Oil and Gas Leases	Acres	-3,700	0
INCOME FROM PROPOSED INVESTMENTS [4]			
Grazing	$	0 to +6,404	+16,573
Big game hunting	$	0 to +129	+189
Upland game hunting	$	0 to +231	+231
Fishing	$	0 to +137	+137
Construction activity [5]	$	0 to +3,567	+21,875
Total [6]	$	0 to +6,901	+17,130
INCOME FROM OTHER EXPECTED OUTPUT CHANGES			
Grazing:			
Adjustments	$	0 to +16,614	+16,614
Oil and Gas Leases	$	-1,114	0
Total	$	-1,114 to +15,500	+16,614
INCOME FROM ALL OUTPUT CHANGES			
All categories [6]	$	-1,114 to +22,401	+33,744

[1] Adjustments to utilize currently available but unallocated livestock forage.

[2] Expected future increases due to range improvement investments.

[3] Expected future increases due to proposed projects.

[4] Vegetative manipulation projects involving up to $136,550 total expenditures, and structural projects involving up to $26,000. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[5] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[6] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 5.

Table 10c. Effects of Alternatives on Local Personal Income, Wildcat Canyon WSA (OR-2-72D) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness, Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Adjustments [1]	AUM	0 to +1,985	+1,985
Investment [2]	AUM	0 to +820	+1,100
Big game hunting [3]	RVD	0 to +9	+28
Upland game hunting [3]	RVD	0 to +11	+13
Fishing [3]	RVD	0 to +31	+31
INCOME FROM PROPOSED INVESTMENTS [4]			
Grazing	$	0 to +13,186	+17,688
Big game hunting	$	0 to +76	+238
Upland game hunting	$	0 to +146	+172
Fishing	$	0 to +366	+366
Construction activity [5]	$	0 to +4,381	+7,802
Total [6]	$	0 to +13,774	+18,464
INCOME FROM OTHER EXPECTED OUTPUT CHANGES			
Grazing:			
Adjustments	$	0 to +31,919	+31,919
Total	$	0 to +31,919	+31,919
INCOME FROM ALL OUTPUT CHANGES			
All categories [6]	$	0 to +45,693	+50,383

[1] Adjustments to utilize currently available but unallocated livestock forage.

[2] Expected future increases due to range improvement investments.

[3] Expected future increases due to proposed projects.

[4] Vegetative manipulation projects involving up to $24,914 total expenditures, and structural projects involving up to $31,900. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[5] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[6] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 5.

Table 10d. Effects of Alternatives on Local Personal Income, Heath Lake WSA (OR-2-72F) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +700	+1,200	+1,200
Big game hunting [2]	RVD	0	+6	+6
Oil and Gas Leases	Acres	-4,695	-4,695	0
INCOME FROM PROPOSED INVESTMENTS [3]				
Grazing	$	0 to +5,860	+10,045	+10,045
Big game hunting	$	0	+60	+60
Construction activity [4]	$	0 to +1,609	+13,938	+13,938
Total [5]	$	0 to +5,860	+10,105	+10,105
INCOME FROM OTHER EXPECTED OUTPUT CHANGES				
Oil and Gas leases	$	-1,414	-1,414	0
Total	$	-1,414	-1,414	0
INCOME FROM ALL OUTPUT CHANGES				
All categories [5]	$	-1,414 to +4,446	+8,691	+10,105

[1] Expected future increases due to range improvement investments.

[2] Expected future increases due to proposed projects.

[3] A vegetative manipulation project involving $81,950 total expenditures, and structural projects involving $12,000. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[5] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 4.

Table 10e. Effects of Alternatives on Local Personal Income, Table Mountain WSA (OR-2-72I) (1981 price levels)

Item	Unit of Measure	All Wilderness Enhanced Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +1,020	0 to +1,020	+1,150
Big game hunting	RVD	0	0	+13
Upland game hunting	RVD	0	0	+2
Oil and Gas leases	Acres	-18,000	-12,765	0
Geothermal leases	Acres	-7,376	-7,376	0
INCOME FROM PROPOSED INVESTMENTS [2]				
Grazing	$	0 to +8,538	0 to +8,538	+9,626
Big game hunting	$	0	0	+129
Upland game hunting	$	0	0	+31
Construction activity [3]	$	0 to +3,017	0 to +4,089	+6,444
Total [4]	$	0 to +8,538	0 to +8,538	+9,786
INCOME FROM OTHER EXPECTED OUTPUT CHANGES				
Oil and Gas leases	$	-5,421	-3,844	0
Geothermal leases	$	-4,280	-4,280	0
	Total [4]	-9,701	-8,124	0
INCOME FROM ALL OUTPUT CHANGES				
All categories [4]	$	-9,701 to -1,163	-8,124 to +414	+9,786

[1] Expected future increases due to proposed projects.

[2] A vegetative manipulation project involving $17,560 total expenditures, and structural projects involving $30,500. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[5] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 3.

Table 10f. Effects of Alternatives on Local Personal Income, West Peak WSA ((OR-2-72J) (1981 price levels)

Item	Unit of Measure	All Wilderness Enhanced Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +350	+700	+700
Big game hunting [2]	RVD	0 to +1	+3	+3
Upland game hunting [2]	RVD	0	+1	+1
Oil and Gas leases	Acres	-6,826	-6,826	0
Geothermal leases	Acres	-550	-550	0
INCOME FROM PROPOSED INVESTMENTS [3]				
Grazing	$	0 to +2,930	+5,859	+5,859
Big game hunting	$	0 to +10	+30	+30
Upland game hunting	$	0	+15	+15
Construction activity [4]	$	0 to +1,234	+4,709	+4,709
Total [5]	$	0 to +2,940	+5,904	+5,904
INCOME FROM OTHER EXPECTED OUTPUT CHANGES				
Oil and Gas Leases	$	-2,055	-2,055	0
Geothermal leases	$	-166	-166	0
Total [5]	$	-2,221 0	-2,221	
INCOME FROM ALL OUTPUT CHANGES				
All Categories [5]	$	-2,221 to +719	+3,683	+5,904

[1] Expected future increases due to range improvement investments.

[2] Expected future increases due to proposed projects.

[3] A vegetative manipulation project involving $25,920 total expenditures, and structural projects involving up to $9,200. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[4] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 4.

Table 10g. Effects of Alternatives on Local Personal Income, Palomino Hills WSA (OR-3-114) (1981 price levels)

Item	Unit of Measure	All Wilderness Enhanced Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Adjustments [1]	AUM	0 to +4,420	+2,435 to +4,420	+4,420
Investment [2]	AUM	0 to +450	+450	+450
Big game hunting [3]	RVD	0 to +6	+6	+6
Upland game hunting [3]	RVD	0 to +8	+8	+8
Fishing [3]	RVD	0 to +56	+56	+56
INCOME FROM PROPOSED INVESTMENTS [4]				
Grazing	$	0 to +7,236	+7,236	+7,236
Big game hunting	$	0 to +51	+51	+51
Upland game hunting	$	0 to +106	+106	+106
Fishing	$	0 to +661	+661	+661
Construction activity [5]	$	0 to +6,482	+6,482	+6,482
Total [6]	$	0 to +8,054	+8,054	+8,054
INCOME FROM OTHER EXPECTED OUTPUT CHANGES				
Grazing:				
Adjustments	$	0 to +71,074	+39,155 to +71,074	+71,074
INCOME FROM ALL OUTPUT CHANGES				
All categories [6]	$	0 to +79,128	+39,155 to +79,128	+79,128

[1] Adjustments to utilize currently available but unallocated livestock forage.

[2] Expected future increases due to range improvement investments.

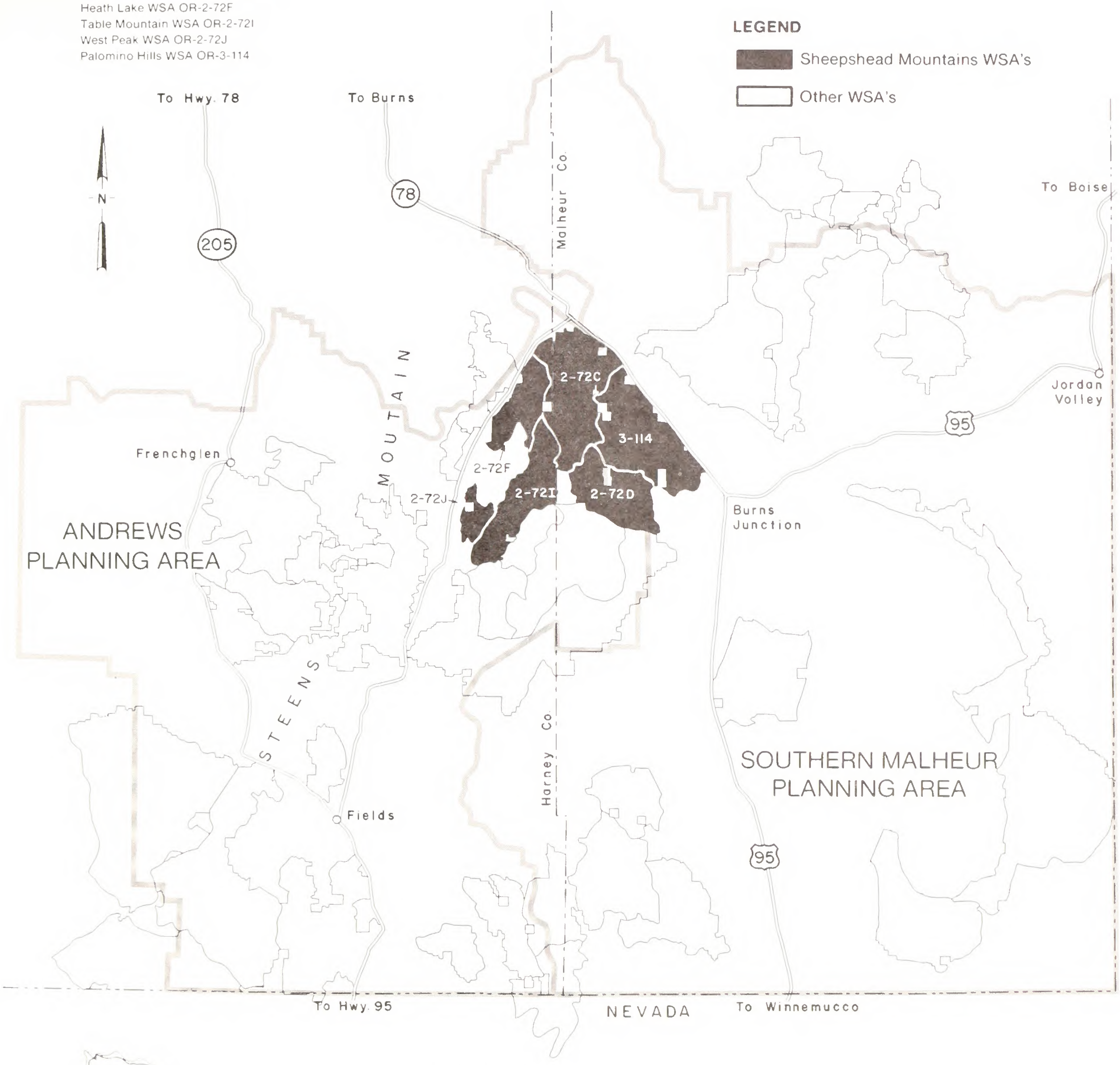
[3] Expected future increases due to proposed projects.

[4] Expenditures for structural projects involving up to $47,200, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[5] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[6] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 5.

Sheepshead Mountain WSA OR-2-72C
Wildcat Canyon WSA OR-2-72D
Heath Lake WSA OR-2-72F
Table Mountain WSA OR-2-72I
West Peak WSA OR-2-72J
Palomino Hills WSA OR-3-114



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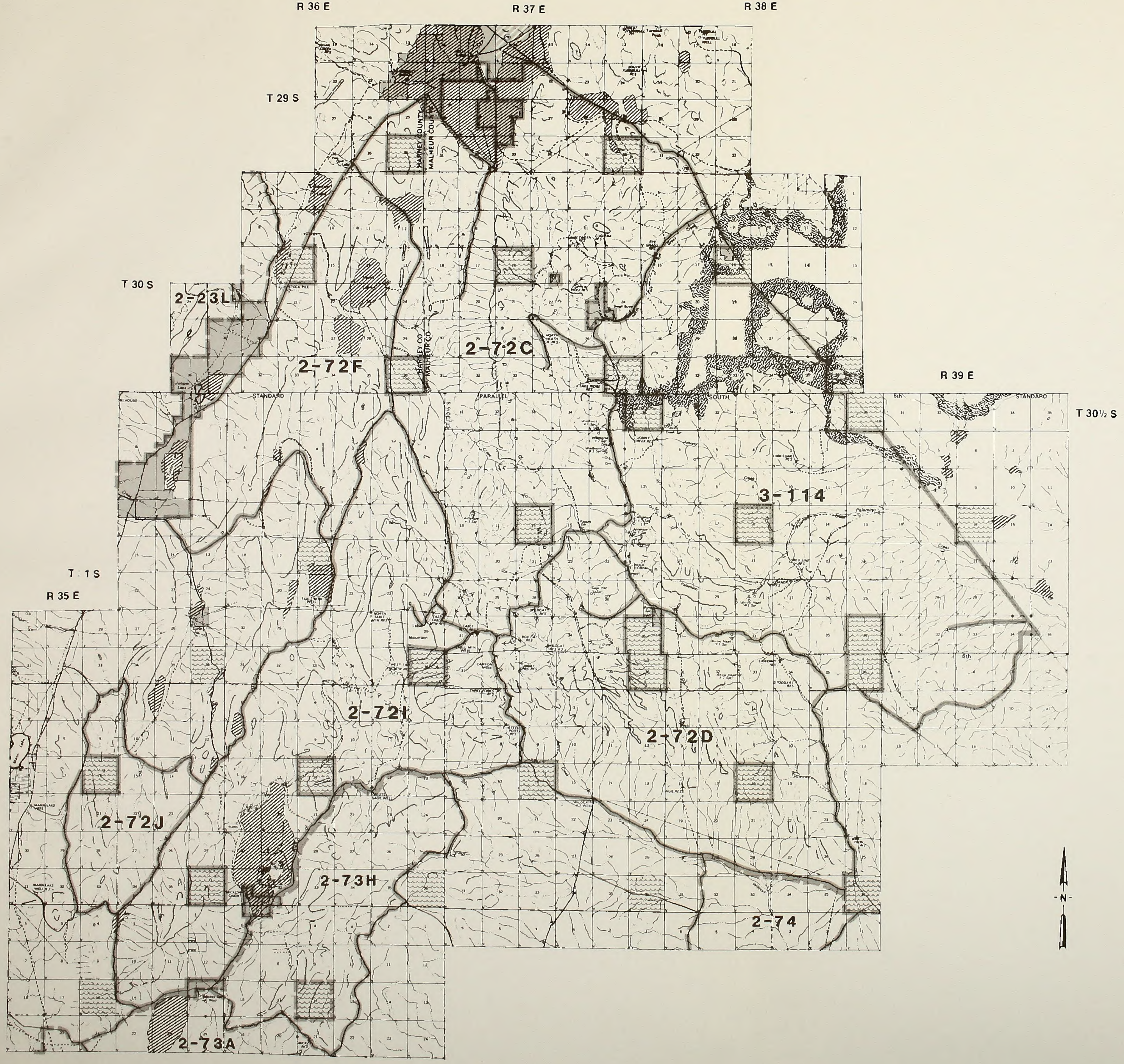
Burns/Vale Districts

Sheepshead Mountains WSA's

LOCATION MAP

10 0 10 MILES

MAP 1



Sheepshead Mountain WSA OR-2-72C
Wildcat Canyon WSA OR-2-72D
Heath Lake WSA OR-2-72F
Table Mountain WSA OR-2-72I
West Peak WSA OR-2-72J
Palomino Hills WSA OR-3-114

LEGEND

— Wilderness Study Area Boundary
- - Boundary of Adjacent Wilderness Study Areas
☐ Bureau of Land Management
▨ State
▩ Private
▤ BLM Surface-State or Private Subsurface (Split Estate)
▦ Edge of Lava

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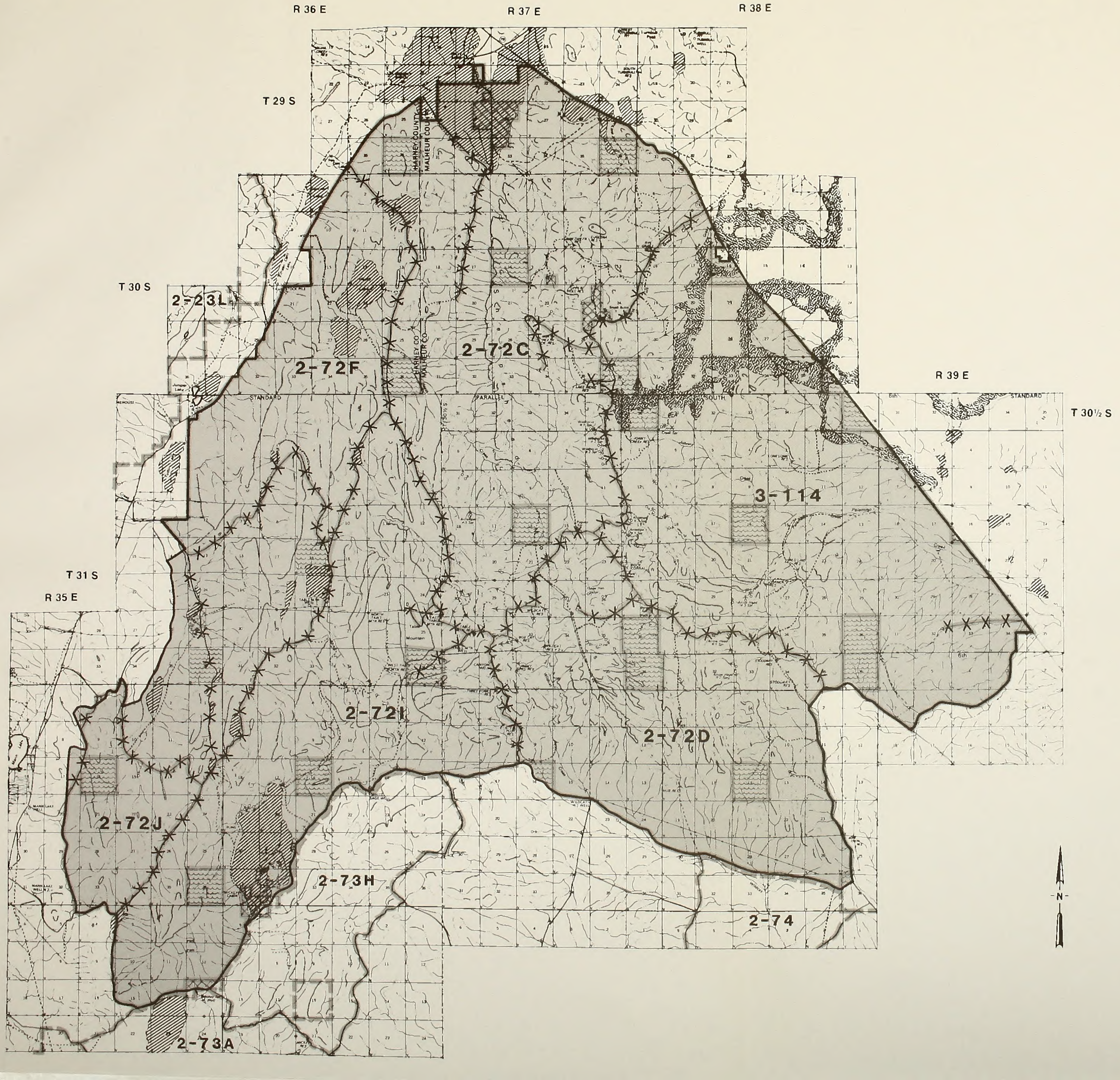
Sheepshead Mountains WSA's

LAND OWNERSHIP

1 0 1 2 3 MILES

MAP 2



Sheepshead Mountain WSA OR-2-72C
Wildcat Canyon WSA OR-2-72D
Heath Lake WSA OR-2-72F
Table Mountain WSA OR-2-72I
West Peak WSA OR-2-72J
Palomino Hills WSA OR-3-114

LEGEND

— Wilderness Study Area Boundary
- - Boundary of Adjacent Wilderness Study Areas
▭ Recommended Suitable for Wilderness
▨ Recommended Non-suitable for Wilderness
▩ Non-Federal Land within Recommended Wilderness
▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness
✕✕ Recommended Road Closure

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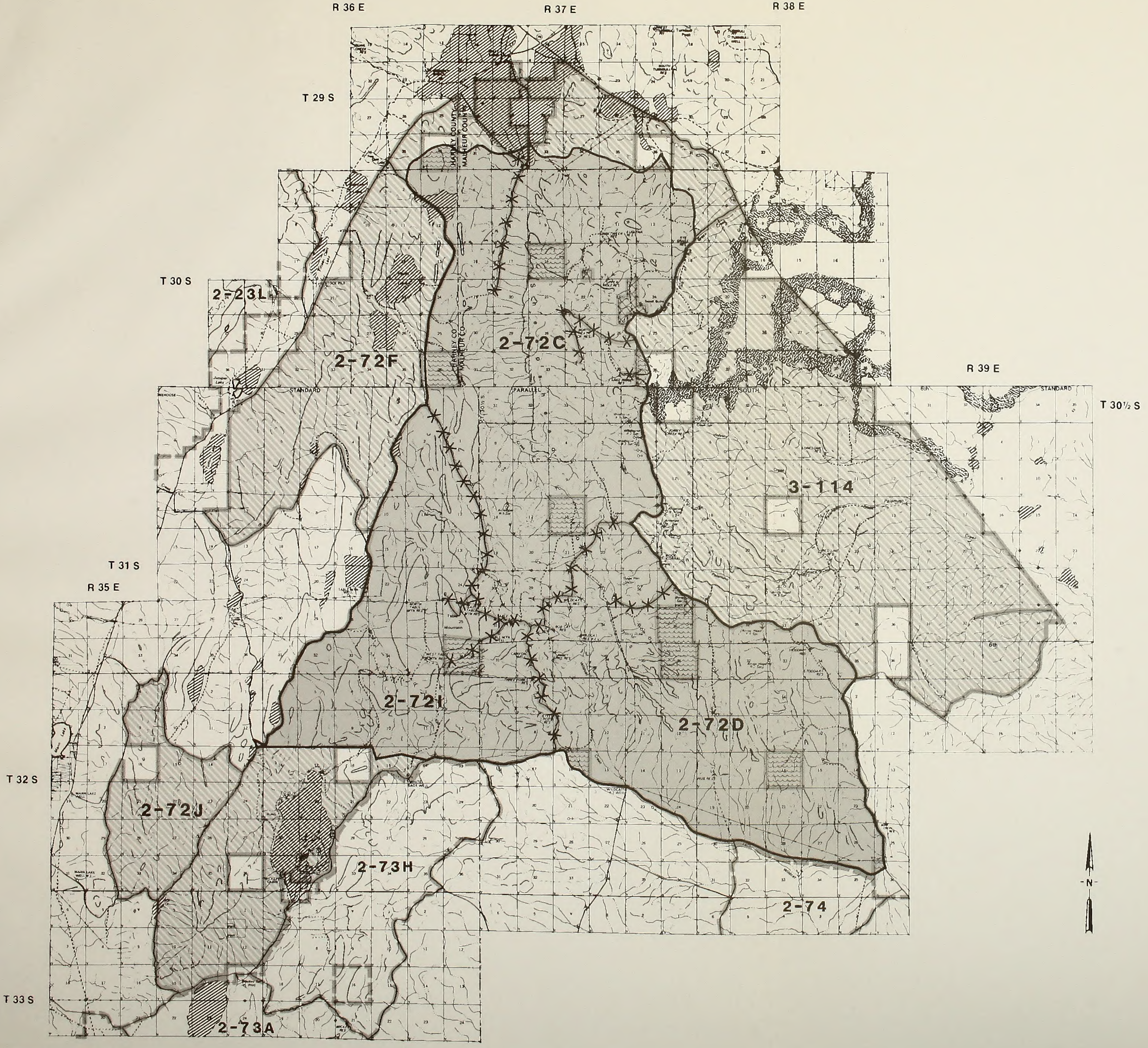
Sheepshead Mountains WSA's

ENHANCED ALTERNATIVE

1 0 1 2 3 MILES

MAP 3



Sheepshead Mountain WSA OR-2-72C
Wildcat Canyon WSA OR-2-72D
Heath Lake WSA OR-2-72F
Table Mountain WSA OR-2-72I
West Peak WSA OR-2-72J
Palomino Hills WSA OR-3-114

LEGEND

- ▬ Wilderness Study Area Boundary
- ╌ Boundary of Adjacent Wilderness Study Areas
- ▢ Recommended Suitable for Wilderness
- ▨ Recommended Non-suitable for Wilderness
- ▩ Non-Federal Land within Recommended Wilderness
- ▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness
- ✕ ✕ Recommended Road Closure

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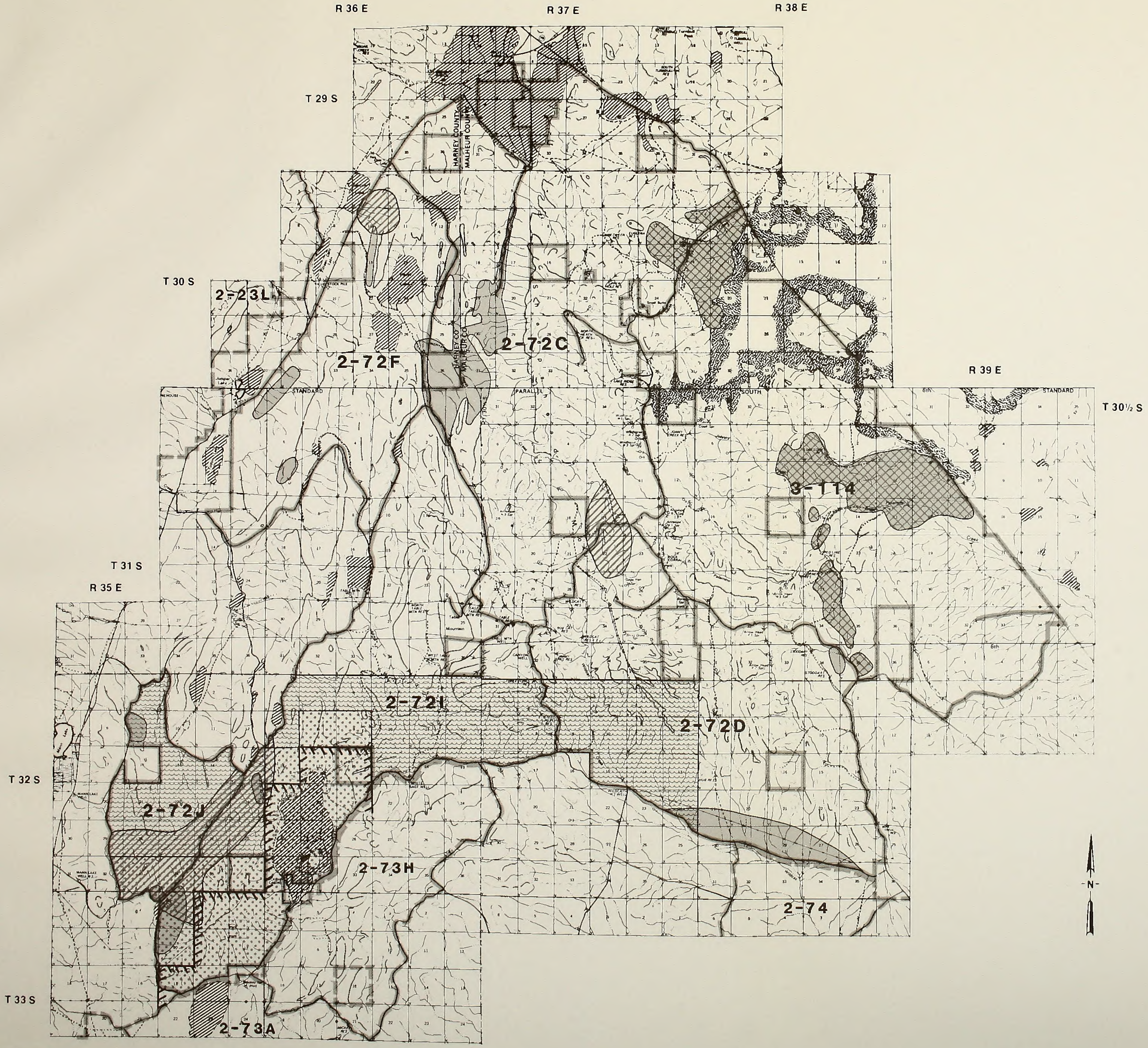
Sheepshead Mountains WSA's

PREFERRED ALTERNATIVE

1 0 1 2 3 MILES

MAP 4



Sheepshead Mountain WSA OR-2-72C
Wildcat Canyon WSA OR-2-72D
Heath Lake WSA OR-2-72F
Table Mountain WSA OR-2-72I
West Peak WSA OR-2-72J
Palomino Hills WSA OR-3-114

- ▨ **Portion of WSA within known Geothermal Resource Area**
- ▤ **Medium Potential (3B) for Geothermal Resources**
- ░ **High Potential (4D) for Geothermal Resources**
- ▩ **Medium Potential (3B) for Diatomite**
- ▧ **Medium Potential (3B) for Gold, Silver, Copper and Mercury**
- ▦ **Medium Potential (3B) for Zeolites**

Entire WSA:
Medium Potential
(3B) for Oil and Gas

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Sheepshead Mountains WSA's

MEDIUM OR HIGH POTENTIAL
MINERAL OR ENERGY RESOURCES

1 0 1 2 3 MILES

MAP 5

Sheepshead Mountains WSA, OR-2-72C. Taken from private land on the northwest side of the study area looking southeast. Much of the area in the foreground is recommended as suitable under the enhanced alternative (nonsuitable under the preferred alternative) while the ridgelines are recommended suitable under both the enhanced and preferred alternatives. The main ridge of the Sheepsheads rises to an elevation of 6,289 feet. June 1983.

Sheepshead Mountains WSA, OR-2-72C. This view, looking west, shows the drainage cutting through a narrow canyon. With the exception of the large ridgeline in the background (part of Steens Mountain) all of the terrain in this photo is within the Sheepsheads group and is recommended suitable under the enhanced alternative, and all of the foreground and most of the middle ground as suitable under the preferred alternative. September 1983.

Wildcat Canyon WSA, OR-2-72D. Looking northwest from a ridgeline dividing two drainages. Within the area recommended suitable under the enhanced and preferred alternatives. This view is representative of the central portion of the study area. The rolling plateau country is deeply cut by a number of intermittent drainages. September 1983.

Wildcat Canyon WSA, OR-2-72D. Looking southeast showing the plateau rapidly dropping along the southern portion of the WSA (the lower flatland in the midground is outside the WSA). All of the rugged terrain in the foreground is within the area recommended suitable under the enhanced and preferred alternatives. This shows one of the many deep canyons in the study area. September 1983.

Heath Lake WSA, OR-2-72F. The north central portion of the study area looking northwest (the ridgeline in the background is the northern end of the Steens Mountain and is outside the WSA). Heath Lake and the ridgeline to the west are easily visible. Within the area recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Heath Lake WSA, OR-2-72F. The north end of the WSA looking north from the ridge south and west of Heath Lake (right of center). (The area in the background is not within the study area.)Within the area recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

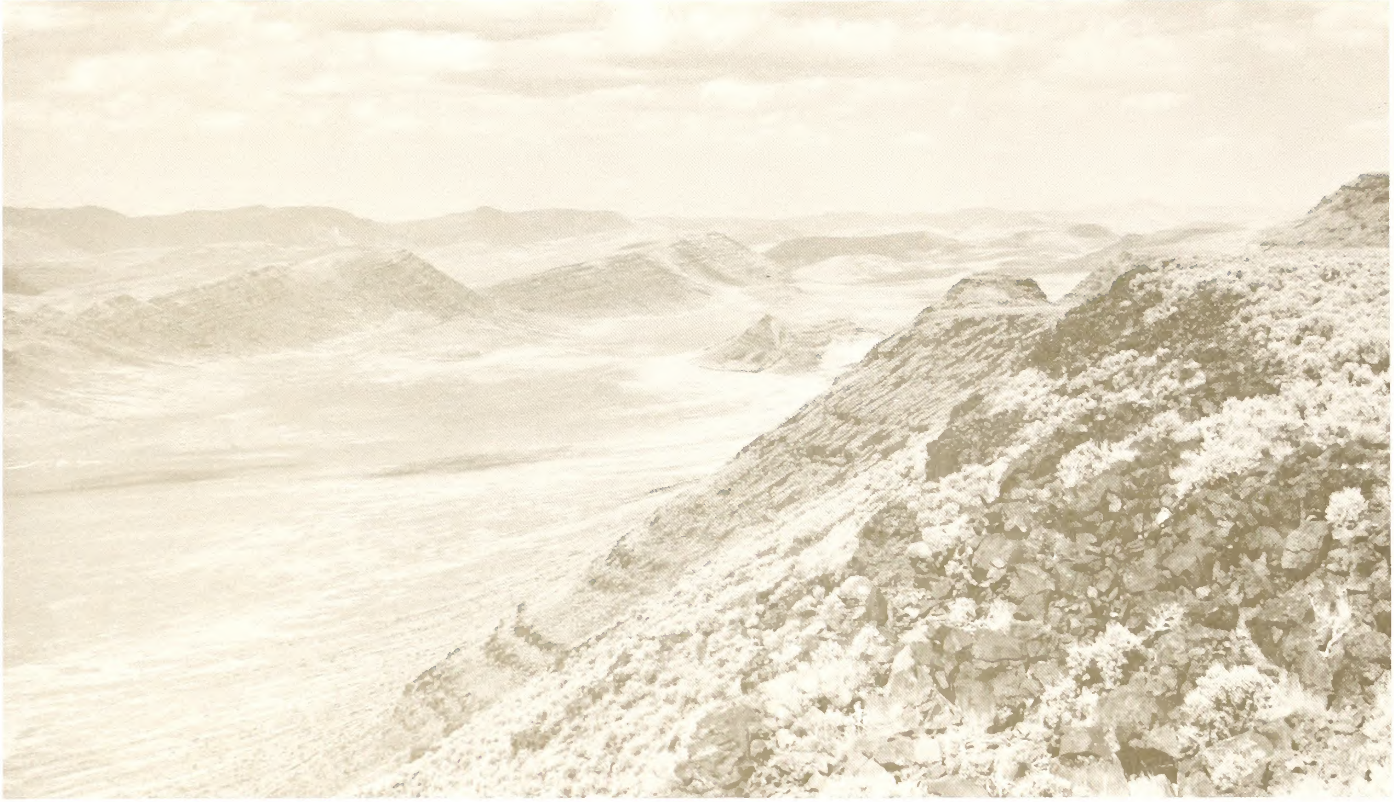


Table Mountain WSA, OR-2-721. Looking north from the top of the ridgeline near the western boundary. The ridge in the foreground and part of the basin are recommended suitable for wilderness under the enhanced and preferred alternatives. This shows the typical terrain in the western portion of the Sheepshead complex. Within the basin on the left is the boundary between the Table Mountain WSA and the Sulphur Springs area. The ridgeline on the left edge of the basin lies along the eastern edge of the Sulphur Springs area. The large ridgeline in the background on the left side is the northern end of Steens Mountain which is outside of the Sheepshead Mountains. September 1983.

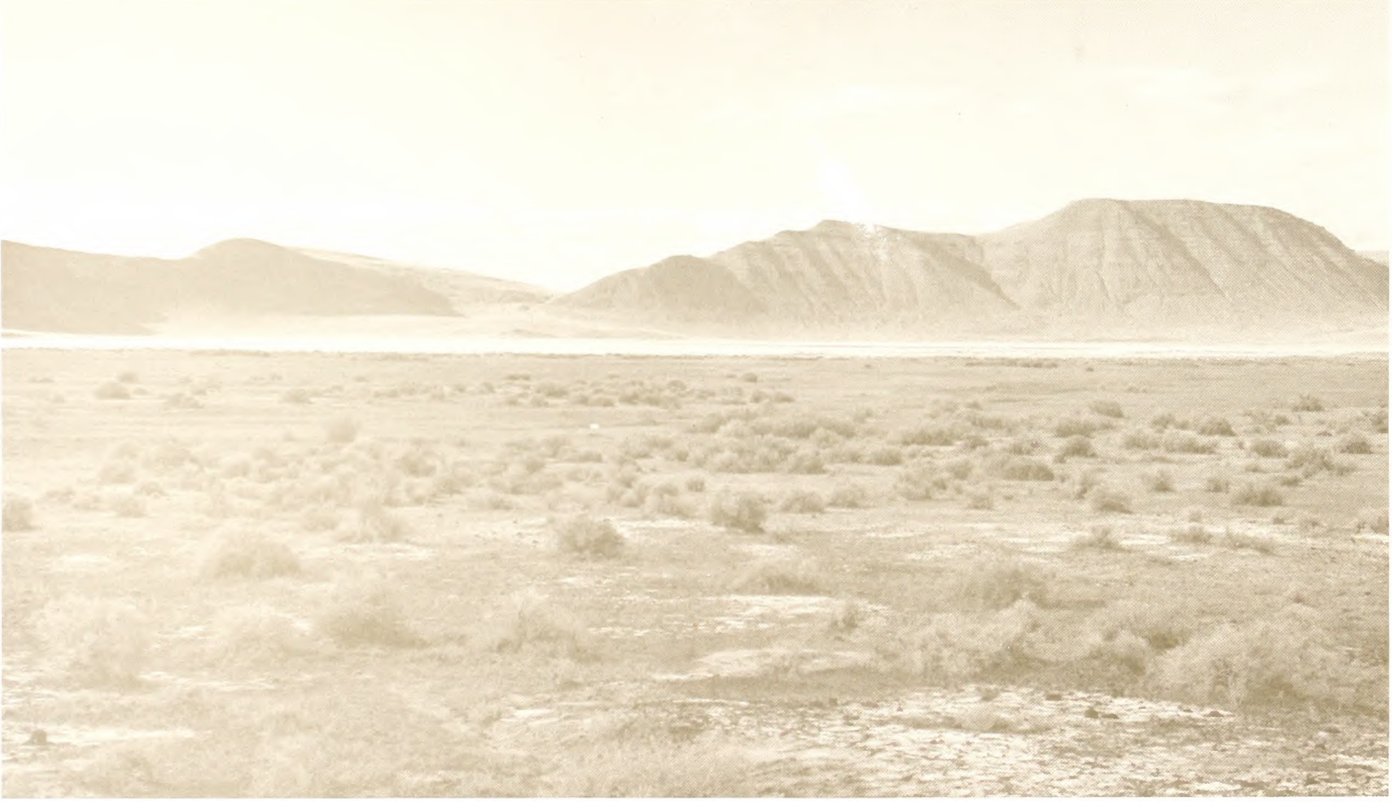


Table Mountain WSA, OR-2-721. Looking north from the southern boundary road in Mickey Basin (the lowest point in the study area and the entire Sheepshead Mountains group). Showing part of the ridgeline surrounding the basin. The light colored area at the base of the ridge is a playa. This portion of the study area is recommended as suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. April 1984.

West Peak WSA, OR-2-72J. Looking across the northern end of the study area to the southeast from the basin east of the ridgeline. The hill on the right side is within the West Peak WSA, while the hills in background (center and left) are in the adjacent Table Mountain WSA (2-72I). Within the area recommended suitable under the enhanced alternative and nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

West Peak WSA, OR-2-72J. Looking south along the ridgeline from the basin east of the ridge. The area is recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. The peak in the background rises over 1,900 feet above the basin. The steep ridgeline offers challenging day hiking and scenic views of the Steens and Sheepshead Mountain areas. September 1983.

Palomino Hills WSA, OR-3 -114. Looking south into Palomino Creek Canyon in the southwest portion of the WSA. Within the area recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Palomino Hills WSA, OR-3 -114. Looking southeast across the hills in the southern portion of the WSA. Within the area recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Winter Range Wilderness Study Area (OR-2-73H)

General Description of the Study Area

The Winter Range wilderness study area (WSA) is located about 70 miles southeast of Burns (20 miles southwest of Burns Junction and U.S. Highway 95) in Harney and Malheur Counties (see map 1). It is about six miles east of the county road which runs along the east side of Steens Mountain from State Highway 78 at Folly Farm (30 miles to the north) to Fields.

The study area contains 14,800 acres of public land. Within the WSA is one 640-acre parcel of split-estate land (federally managed surface, state or privately owned subsurface mineral rights). The area is 9 miles long and somewhat narrow, averaging about three miles in width (see map 2). The boundaries of the study area are formed almost entirely by BLM roads, although two small parcels of private land border the area on the western side.

The WSA contains several distinct topographic features. A steep escarpment averaging about 500 feet high runs along the entire west-central side of the study area. To the west and below this ridge lies a basin area. Portions of both the Alvord Desert Basin and the Mickey Basin are included in this part of the study area. Along the western boundary, within the Mickey Basin portion of the area, the WSA reaches its lowest elevation at 3,924 feet.

Just over a mile to the southeast, near the center of the WSA, the plateau area east of the escarpment rises to a height of 5,122 feet, the highest point in the study area. From the top of the escarpment, the landscape on the plateau slopes gradually downward to the southeast, and consists of gently rolling terrain. The eastern portion of the study area contains a small, usually dry playa lakebed which lies near the boundary.

The dominant vegetation within most of this area is sagebrush. However, a number of other species typical of a desert basin environment are also present in the WSA. These include greasewood, shadscale, spiny hopsage, budsage, saltgrass, and a variety of grasses.

Interrelationships

The Winter Range WSA is adjacent, on two sides, to two other wilderness study areas: Table Mountain WSA (OR-2-72I) on the north side and East Alvord wilderness study area (OR-2-73A) on the west. The three WSAs are separated by roads. The roads which separate these areas are used and maintained by BLM and livestock operators; they are also used by recreationists.

Some 50 acres of the southwest corner of the

Winter Range WSA is part of the 560-acre Mickey Basin Research Natural Area (RNA) (see map 2). The RNA includes a stand of winterfat in good condition. The RNA was designated to protect the area for research and educational purposes.

The Oregon Department of Fish and Wildlife (ODFW) has identified the Mickey Basin/Table Mountain area as potential yearlong habitat for bighorn sheep. They propose to release bighorn sheep in the area sometime prior to 1987 as part of a program to reintroduce bighorns to their former range. The site is one of six identified in BLM's Burns District as a potential transplant site and ranks third on the Department's priority list for the Burns District. Sheep released into the Mickey Basin may use the northern part of the study area, but they will probably concentrate to the north.

All of the WSA is on the Alvord-Tule Springs wild horse herd management area (HMA). HMA management will not be significantly affected by any of the alternatives.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- potential geothermal exploration and development within the area, as well as other possible mineral development,

- the effects of such development on bighorn sheep,

- control of wild horses in the area (see Statewide EIS volume), and

- use of the area by military aircraft (Military jet aircraft use the area frequently for low altitude training flights. The influence of these flights on a visitor's perception of solitude and, to some degree, naturalness, is extreme for a short period of time (1 to 2 minutes), but it is also quite temporary. These flights do not have a significant, long lasting, adverse effect on a visitor's opportunity to find solitude.)

Also identified as an issue was the possibility of combining the Winter Range study area with other WSAs in the vicinity to form a single wilderness area.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- no wilderness/no action (preferred alternative)

An enhanced wilderness alternative, which would recommend combining the Winter Range study area with the two adjacent WSAs, is not analyzed. Combining the Winter Range WSA with the study area to the north (Table Mountain 2-72I) is not feasible, because of the significance of the boundary road which separates the two areas. This road (commonly referred to as the Mickey Hot Springs Road) provides access to the southern end of the Sheepshead Mountains area as well as the eastern portions of the Alvord Desert region. It is used primarily by grazing operators for checking livestock and range improvements. However, BLM personnel, recreationists, and private landowners also use the road.

The road to the south, dividing the Winter Range area from the East Alvord study area (2-73A), is not as well used as the Mickey Hot Springs road. It is used by grazing operators, BLM personnel, and recreationists. Combining these two WSAs would not substantially improve the manageability or wilderness qualities of either study area.

An enhanced wilderness alternative which would consider acquisition of the split-estate inholdings or the private property around the perimeter of the area is not analyzed because it would not be substantially different from the all wilderness alternative.

A partial alternative is not analyzed because there are no opportunities to eliminate conflicts by recommending a portion of the study area as suitable and still retain the area's wilderness qualities.

All Wilderness

The all wilderness alternative would recommend all 14,800 acres of public land in the study area suitable as wilderness (see map 2). For purposes of analysis, it is assumed the split-estate inholding would not be acquired.

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued vehicle use in the area, and

- continued availability for mineral exploration and development (there are existing geothermal leases in the area and it is covered by oil and gas leases).

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The Winter Range WSA would be manageable as wilderness under the all wilderness alternative, with some minor manageability problems.

The split-estate inholding in the southeastern corner of the WSA would not be manageable as wilderness if the owner of the mineral rights developed the mineral resources. There are no known plans for developing this parcel; however, this part of the study area has moderate potential for the occurrence of geothermal and oil and gas resources. Access and development would affect naturalness and solitude in this portion of the WSA.

Table 1. Summary of Proposed Management Under Each Alternative, Winter Range WSA (OR-2-73H)

Proposed Management	All Wilderness	No Wilderness/No Action
Acres Designated as Wilderness	14,800	0
Acres Closed to ORVs by Wilderness Designation	14,800	0
Miles of Ways Closed	3	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	14,800	0

Potential development of adjacent private lands could not be controlled and would have an adverse effect on the natural appearance and opportunities for solitude within the WSA. Currently, there are no known plans for development on these parcels.

The potential manageability problems of the study area are not substantial.

Rationale for the Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because the benefits of wilderness management would be outweighed by the benefits of maintaining options for development of resources in the area. The WSA has both moderate and high potential for the occurrence of geothermal resources. Part of the study area lies within the Alvord Known Geothermal Resources Area (KGRA, a federally defined area with specific boundaries within which geothermal resources are known to exist) and has a high geothermal potential. The area also has moderate potential for oil and gas resources. Although the area meets the minimum criteria for designation as a wilderness study area and contains special wilderness features, these qualities are not sufficient to outweigh the benefits of leaving the area open for other uses.

Affected Environment

This section discusses only those activities or resources which influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Winter Range WSA appears to be in a relatively natural condition. Most of the man-made features can be seen from only a very small portion of the WSA.

There are 8 man-made developments in the Winter Range WSA: 3 reservoirs, 1 well, 2 fences totaling 1 1/2 miles, and 2 ways (vehicle routes established and maintained solely by the passage of vehicles),

Table 2. Summary of Environmental Consequences of Alternatives, Winter Range WSA (OR-2-73H)

Resource or Activity	All Wilderness (Preferred Alternative)	No Wilderness/No Action
Wilderness Values	Would add 14,800 acres to NWPS. Maintain the present level or improve quality of area's wilderness characteristics and protect the special features including the botanical values, wild horses and scenic quality. Includes a portion of the Mickey and Alvord Basins and the steep escarpments. Closure of 3 miles of ways would return the area to a more natural condition and increase opportunities for solitude and primitive recreation. Although minor manageability problems occur due to inholdings, the area would be manageable as wilderness.	Wilderness values and special features would be subject to possible disturbance from potential development of mineral or energy resources.
Energy and Mineral Development	Development precluded on 14,800 acres including 5,166 acres with high potential for geothermal resources, 9,634 acres with moderate potential for geothermal resources and 14,800 acres with moderate potential for oil and gas resources.	No impact.
Recreation Use	Use of motorized vehicles restricted to roads. No change in overall recreation use.	Existing vehicle-oriented uses of the area would continue. No change in overall recreation use.
Economic Value and Local Income	Decrease in economic value and local personal income by $20,368 and $6,126, respectively, from loss of oil and gas and geothermal leases. The maximum increase in transportation costs to ranchers with grazing permits would be $24.	No impact.

totaling 3 miles in length. They influence about 3 percent. (The area of influence is an estimate of the acreage in the WSA from which these man-made features can be seen.)

The water developments are scattered around the perimeter of the area. They are relatively minor and are fairly well screened by location and adjacent topography. The vehicle ways are in the west side of the study area and do not have a major influence on the area due to the terrain and vegetation in which they are located. Like the vehicle ways, the fences enter the WSA from the western boundary and their influence on the study area is minimal.

Features and activities outside the area do not detract from the wilderness character of the study area. The boundary roads have a small effect on the area's wilderness values because they pass through flat or gently sloping terrain which decreases their visibility. Other outside sights -- small water developments -- have a very minor influence on the area.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude in the Winter Range WSA are outstanding. The size, shape, and topography of the WSA enhance the opportunities for solitude. Much of the WSA provides topographic screening, primarily along the main ridgeline which runs north and south through the study area. Scattered ridges and buttes in the gently rolling eastern portion of the area provide some topographic screening and enhance solitude values in this part of the WSA.

The area does not provide any outstanding opportunities for primitive recreation. Opportunities for day hiking, backpacking, hunting, and sightseeing exist, but they are not considered to be of outstanding quality.

Special Features

There are several features within the Winter Range WSA which add to the value of the area as wilderness, including vegetation, wild horses and scenery.

The size and condition of the winterfat community, for which the Mickey Basin RNA was designated, is uncommon in Oregon. The site contains a nearly pure stand of winterfat in good condition.

Kit fox, on the Oregon Department of Fish and Wildlife's List of Threatened Species, may range into the WSA.

The scenery of the study area is outstanding in the southwestern corner. The view area covers the top of the Steens Mountain to the east side of the Alvord Basin.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the WSA is located in the Intermountain Sagebrush Province and the potential native vegetation is saltbush-greasewood.

Six vegetative communities listed in the Basin and Range section of the Oregon Natural Heritage Plan occur in this WSA: bare playa/and playa margin communities, greasewood/saltgrass community, shadscale-spiny hopsage-budsage community complex, winterfat community, big sagebrush-spiny hopsage community, and big sagebrush/bluebunch wheatgrass.

The study area is within 5 hours' driving time of one standard metropolitan statistical area, Boise, Idaho.

Energy and Mineral Development

The geology, energy, and mineral resources of the Winter Range WSA were evaluated by interpreting existing literature, reviewing mining claim and mineral leasing records, and correlating rock units in the WSA with similar environments in other areas that are known to contain mineral deposits. Technical details of the findings of the evaluation are in a report of the assessment of mineral resources, Sheepshead Mountain Geologic Resource Area (GRA OR-023-18), Harney and Malheur Counties, Oregon, prepared by TERRADATA, a BLM contractor, and also in a BLM report on the assessment of mineral resources in the South Harney GRA.

The WSA is within the South Harney geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire area has a moderate favorability for oil and gas resources. Six oil and gas leases (as of January 1, 1984) cover 12,424 acres within the WSA.

A large portion of the study area falls within the Alvord KGRA. Following legal subdivisions, the KGRA boundary covers most of the western side of the study area including portions of the Mickey and Alvord Basins and part of the escarpment. Most of the western side of the WSA also has been rated with a high favorability for geothermal resources. This portion mostly lies within the Alvord KGRA. The rest of the WSA has a moderate favorability for geothermal potential. Six geothermal leases (as of January 1, 1984) cover 3,960 acres.

Table 3 shows the mineral potential classifications for the study area. Map 3 shows the portion of the WSA rated high for geothermal resources.

Aside from abundant road aggregate sources, there are no known occurrences of mineral deposits within the WSA. There were no mining claims in the study area as of January 1, 1984.

The surface rocks are composed of a mixture of Steens Basalt and Steens Mountain volcanic series. These consist of numerous thin flows of olivine basalt, platy andesite, and flow breccias and rare interlayers of tuffs, both with a cumulative thickness of several thousand feet. Locally, the area is overlain with semiconsolidated lacustrine (lake) tuffaceous sediments and ash flow tuffs. Also occurring are minor basaltic dikes or sills.

Vegetation

The most extensive vegetative community in the Winter Range WSA is a complex where a big sagebrush/bunchgrass community and a shadscale/budsage community are intermittently

Table 3. Classification of Energy and Mineral Potential, Winter Range WSA (OR-2-73H)

Commodity	Area	Classification Level	Confidence Level
Metals (mercury, copper, gold)	Entire WSA	2	B
Geothermal	See map 3	4	D
	Rest of WSA	3	B
Uranium/Thorium	Entire WSA	1	A
Coal	Entire WSA	2	C
Oil/Gas	Entire WSA	3	B
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	B
Bentonite	Entire WSA	2	A
Diatomite	Part of area (not shown on map)	2	A
	Rest of WSA	1	B
Zeolites	Entire WSA	2	A
Sodium	Entire WSA	2	A

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low Favorability
Class 3 - Moderate Favorability
Class 4 - High Favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

dominant. This complex occurs all across the uplands of the WSA. These communities occur independently in some areas as well as in this complex.

The big sagebrush/bunchgrass community is the most dominant community. At the highest elevations, bluebunch wheatgrass occurs. The estimated successional stage is early to mid-seral (a stage of ecological condition based on the difference between the present plant community and the climax vegetation, the relatively stable, final stage in plant succession). The probable climax vegetation is big sagebrush, Indian ricegrass, squirreltail, and spiny hopsage. Bluebunch wheatgrass would be a climax species in the higher elevations.

The shadscale/budsage community occurs in the rocky, rolling hills just above the saline basins as well as in the complex. The estimated successional stage is early to mid-seral. The primary climax species are shadscale, budsage, and Indian ricegrass.

A greasewood/saltgrass community exists in the saline basins, along the edges of the playas, and in the sandy areas. The estimated successional stage is early to mid-seral. The climax community contains alkali sacaton, and Great Basin wildrye with some greasewood and saltgrass.

There are very small areas containing a community of winterfat. The estimated successional stage is mid-seral. The climax vegetation is primarily winterfat, Nuttal's saltbush, Indian ricegrass, creeping wildrye, and squirreltail also occur in minor amounts. The portion of the Mickey Basin RNA which is in this WSA provides management and protection for a winterfat community.

Wildlife

There is little water available for wildlife in the Winter Range WSA during the warmer months. Water is available along the west edge of the WSA in seeps and springs just outside of the WSA. Due to the lack of year-around water, only mule deer and antelope occasionally use the WSA.

Golden eagle, prairie falcon, great horned owl, and American kestrel are the raptors found in the area. Other common wildlife species include coyote, black-tailed jackrabbit, least chipmunk, antelope ground squirrel, sage sparrow, Brewer's sparrow, horned lark and western rattlesnake. Chukars and sage grouse are present, but not abundant. Bushy-tailed woodrat, canyon mouse, and long-eared myotis (bat) may be found near rimrocks.

Kit fox, on the Oregon Department of Fish and Wildlife's List of Threatened Species, may range into the WSA.

Livestock Grazing

This WSA is located entirely within the Alvord grazing allotment. Table 4 shows existing livestock use in AUMs (animal unit month, the amount of forage required by one cow and calf, or equivalent animals, for one month).

No livestock projects are proposed within this WSA.

Table 4. Existing Livestock Use, Winter Range WSA (OR-2-73H)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)
Alvord (No. 6012)	8,803	12/01 to 02/28	6	438

The existing livestock developments (among the man-made features mentioned in the Naturalness section) include 3 reservoirs, a well, and 1 1/2 miles of fence.

The grazing operator uses motor vehicles on the boundary roads for access to the allotment, but seldom travels on the ways. Horses are used within the WSA to move and gather livestock.

Recreation Use

There is no information on existing recreational use in the Winter Range WSA. It probably receives very little primitive recreation use. Whatever recreation use occurs would probably be vehicle-oriented. Although deer and antelope occasionally use the study area, hunting is poor.

Economic Value and Local Income

Livestock grazing, oil and gas and geothermal leasing, and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were 6 oil and gas leases and 6 geothermal leases on the WSA.

Economic value and local personal income generated from existing levels of resource outputs are presented in table 5. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Table 5. Economic Value and Local Personal Income Generated Annually, Existing Program, Winter Range WSA (OR-2-73H) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	438	$3,303	$3,668
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil and Gas Leases	Acres	12,424	12,424	3,741
Geothermal Leases	Acres	3,960	7,920	2,385
Total			$23,647	$9,794

Effects on Wilderness Values

The **all wilderness alternative** would add 14,800 acres to the National Wilderness Preservation System (NWPS). It would preserve a combination of low basins and high plateaus, including the northern reaches of the Alvord Desert Basin.

Wilderness designation under this alternative would preserve or improve the natural qualities of the area as well as the opportunities for solitude and primitive recreation. Closure of 3 miles of ways would improve the naturalness of the area by eliminating most vehicle use and allowing the ways to revegetate. Closing the ways would also improve opportunities for solitude and the quality of primitive recreation.

The **no wilderness/no action alternative** would subject the wilderness values and special features of the WSA to disturbances from potential oil and gas or geothermal development. (The potential for the occurrence of oil and gas is moderate and the southern part of the WSA lies within a KGRA.)

Surface disturbing activities, such as mineral development, would adversely affect the naturalness of the area. Opportunities for solitude would be adversely affected by any additional vehicle access for new projects or possible mining operations. Primitive recreation values could be lessened by mining activities, depending on the location and the extent of disturbance to recreation attractions.

The botanical values, wild horse herd area, and the scenic values identified as special wilderness features would be subject to disturbance from development of other resources.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development. The **all** wilderness alternative would withdraw 14,800 acres including the area with moderate favorability for oil and gas, which encompasses the entire WSA; 5,166 acres which have high favorability for geothermal resources; and 9,634 acres which have a moderate favorability for geothermal resources.

Effects on Recreation Use

Under the **all wilderness alternative**, opportunities for primitive recreation would be maintained or enhanced. The quality of primitive recreation would be enhanced as a result of the elimination of vehicle use on ways throughout the WSA. Vehicle-oriented recreation is very low, and closing the vehicle ways would not have an effect on the amount of recreation use.

Under the **no wilderness/no action alternative**, primitive recreation would continue to be subject to disturbance by existing vehicle access routes and use. Primitive recreation activities would be further disturbed by possible development. Vehicle-oriented recreation could benefit from additional access due to mineral development. No effect on total recreation use is expected.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 6 and 7. Table 6 shows the effects on economic value and table 7, the effects on local personal income.

Currently, there is little dependence on vehicles for livestock management in the study area. The all wilderness alternative would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $24 per year.

Table 6. Effects of Alternatives on Annual Economic Value, Winter Range WSA (OR2-73H) (1981 price level)

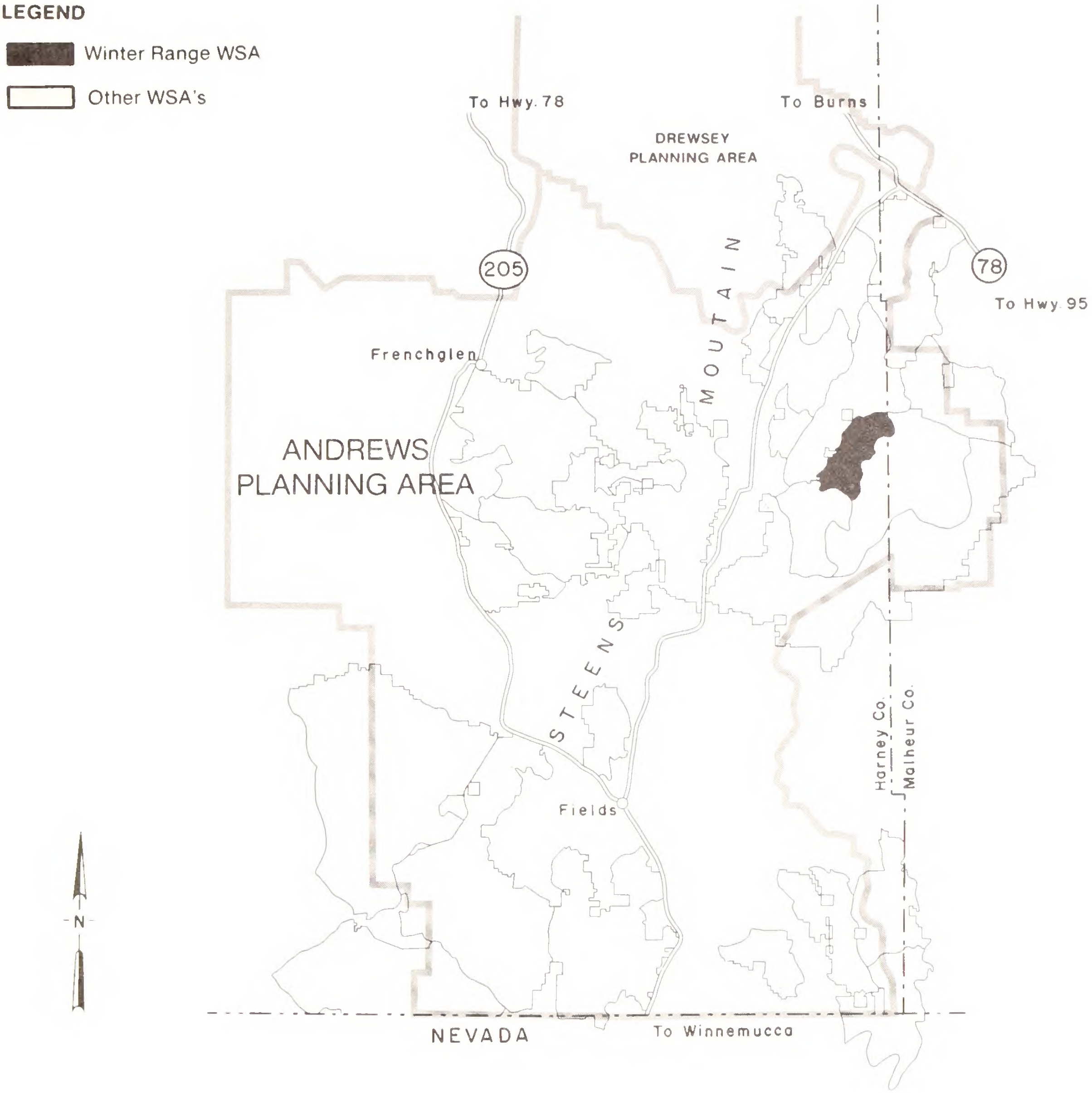
Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Oil and Gas Leases	Acres	-12,424	0
Geothermal Leases	Acres	-3,960	0
VALUE OF EXPECTED CHANGES IN OUTPUTS			
Reduced Access	$	-24	0
Oil and Gas Leases	$	-12,424	0
Geothermal Leases	$	-7,920	0
Total [1]		-20,368	0

[1] Detail may not sum to "Total" due to rounding.

Table 7. Effects of Alternatives on Local Personal Income Winter Range WSA (OR-2-73H) (1981 price level)

Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Oil and Gas Leases	Acres	-12,424	0
Geothermal Leases	Acres	-3,960	0
VALUE OF EXPECTED CHANGES IN OUTPUTS			
Oil and Gas Leases	$	-3,741	0
Geothermal Leases	$	-2,385	0
Total [1]		-6,126	0

[1] Detail may not sum to "Total" due to rounding.



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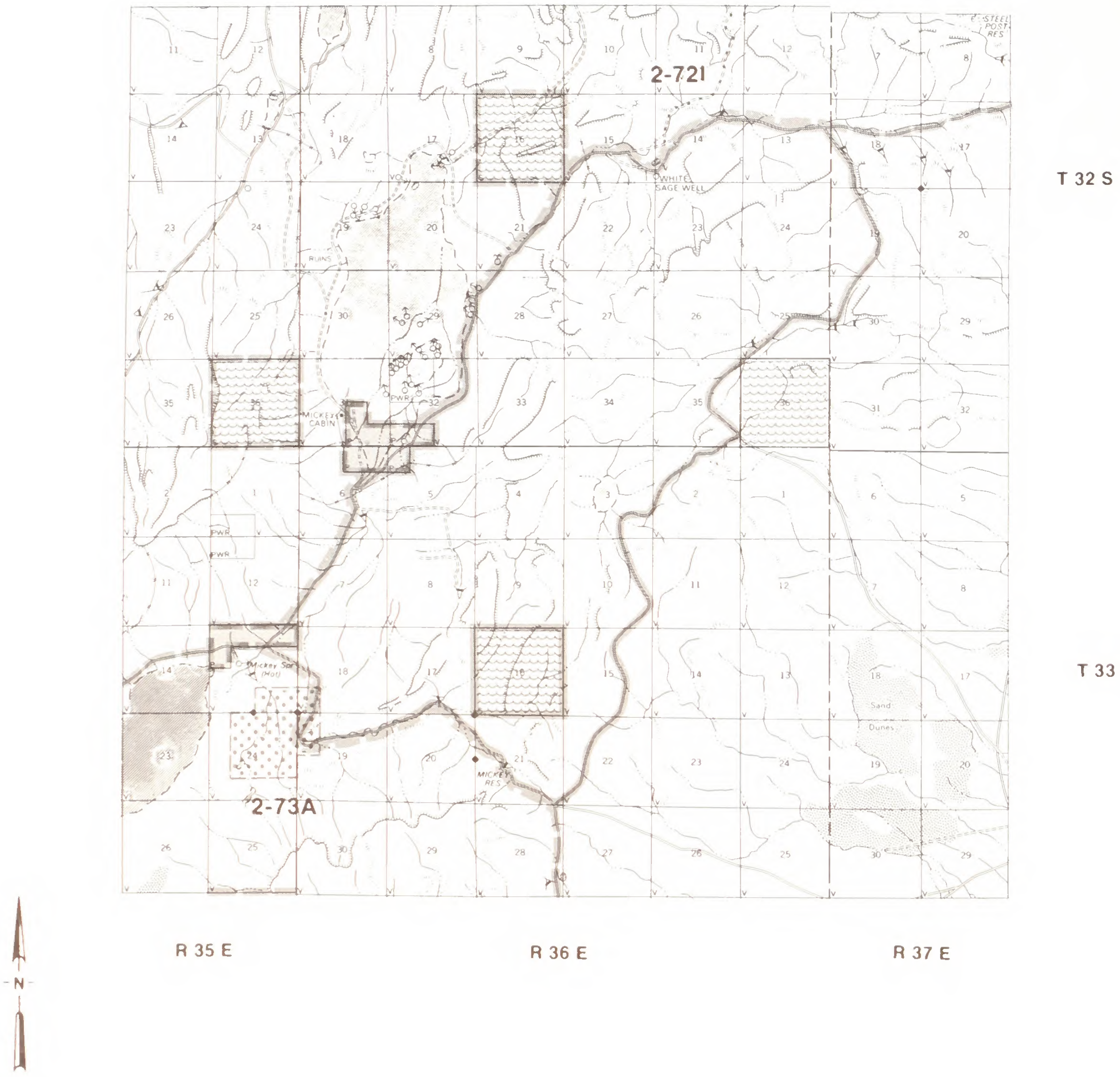
Bureau of Land Management
Burns District

Winter Range WSA
OR-2-73H

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

╍ Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

▨ Private

▤ BLM Surface-State or Private Subsurface (Split Estate)

⁙ Mickey Basin Research Natural Area

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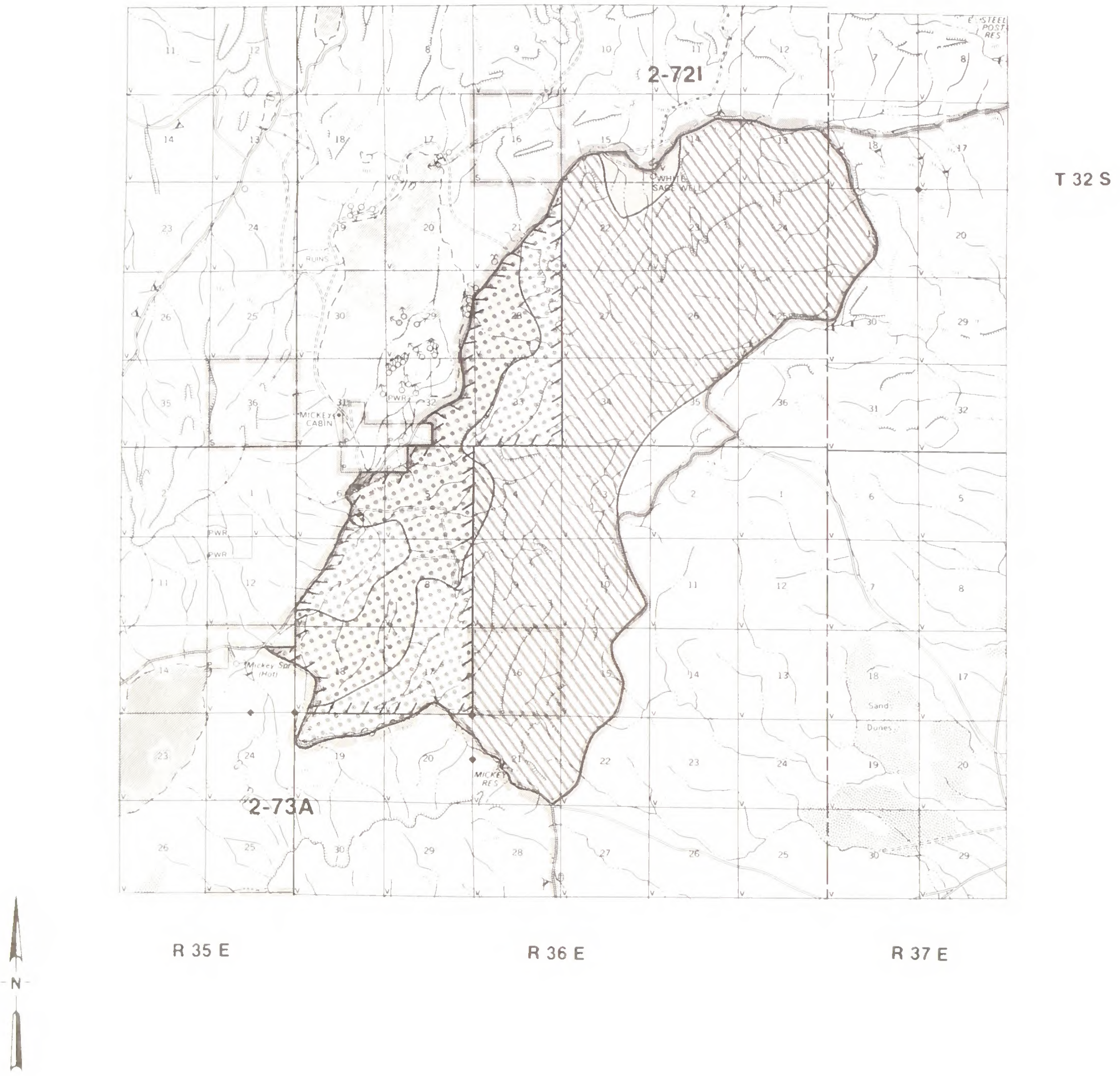
Winter Range WSA
OR-2-73H

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▨ **Portion of WSA within known Geothermal Resource Area**

░ **High Potential (4D) for Geothermal Resources**

▧ **Medium Potential (3B) for Geothermal Resources**

☐ **Medium Potential (3A) for Diatomite**

Entire WSA:
Medium Potential
(3B) for Oil and Gas

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Burns District

Winter Range WSA
OR-2-73H

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 3

Winter Range WSA, OR-2-73H. The northwestern boundary area looking southeast into the study area. The area is nonsuitable under the preferred (no wilderness/no action) alternative. The lower county in the foreground is the southern end of the Mickey Basin area. The ridgeline in the background runs through the length of the WSA and is the northern edge of a relatively flat topped plateau. April 1984.

Winter Range WSA, OR-2-73H. From the southwestern corner of the area looking to the east. Within the area recommended nonsuitable under the preferred (no wilderness/no action) alternative. Considerable topographic relief is characteristic of the ridgeline which runs through the central portion of the WSA. April 1984.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Alvord Desert (OR-2-74) and East Alvord (OR-2-73A) Wilderness Study Areas

General Description of the Study Areas

The Alvord Desert and East Alvord wilderness study areas (WSAs) are located approximately 70 miles southeast of Burns in Harney and Malheur Counties (see map 1). The eastern side of the Alvord Desert WSA is about 8 miles southwest of Burns Junction. The nearest highway is U.S. Highway 95, about 5 miles east of the eastern edge of the Alvord Desert study area. The western edge of the Alvord Desert WSA is partially bounded by the county road which runs from Oregon State Highway 78, at Folly Farm (over 40 miles to the north), to Fields and Denio.

The boundary of the Alvord Desert WSA straddles about 26 miles of BLM's Burns and Vale District boundaries. About half of the study area (on the east and the south) lies within the Vale District. All of the East Alvord WSA is in the Burns District.

The Alvord Desert WSA contains 111,690 acres of public land (see map 2). The irregularly shaped area is 32 miles long from east to west, and 10 miles wide, north to south, at the extremes, narrowing to 3 miles or less in three locations.

The East Alvord WSA contains 21,600 acres of public land. The area is roughly 'T' shaped, being widest in the north, narrowing in the center, and widening slightly again in the south. The area is 8.5 miles from north to south and 6.5 miles from east to west.

In addition, there are 8 sections of split-estate land (federally managed surface, state or privately owned subsurface mineral rights) within both areas' boundaries. Seven parcels are scattered through the Alvord Desert WSA and one parcel is located near the center of the East Alvord study area. All of the parcels are 640-acre sections of land bringing the total inholding acreage to 5,120 acres.

Roads, private land, and split-estate land make up the boundary of the two study areas. The northern boundary of the Alvord Desert study area is formed entirely by BLM roads, including the 12-mile section of road which it shares with the East Alvord WSA. On the east the boundary is an irregular pattern along legal subdivisions, primarily formed by split-estate and some parcels of private land. The southern boundary is a combination of private land, BLM roads, and split-estate land. With the exception of the small (less than 1 mile) section of county road, the western boundary is formed entirely along legal subdivisions with private land.

With the exception of one small parcel of private land, the boundary of the East Alvord WSA is formed entirely by BLM roads.

Also forming part of the boundary of the Alvord

Desert study area are 6 dead-end roads which enter the WSA for a total of 9 miles. Four of these roads enter the WSA from the northern boundary while two enter the area from the south. There are no dead-end roads which penetrate the perimeter of the East Alvord study area.

The Alvord Desert and East Alvord WSAs are within an area of closed drainage basins and desert plateaus. The Alvord Desert WSA consists of a prominent basin and a desert plateau lying east of the 9,700-foot ridge of Steens Mountain. The dominant feature of the study area is the Alvord Desert. The desert is a large (more than 25 square miles within the WSA), clay-bottomed lakebed (playa) which catches seasonal runoff from the east side of the Steens but is generally dry for nearly two-thirds of the year.

Also within the basin on the east side of the playa is a substantial area of sand dunes containing both shifting and stabilized dunes. The basin, including the playa and dunes, covers the western quarter of the WSA and is the lowest point within the study area at 400 feet elevation.

Directly east of the Alvord Basin is a large, steep, west-facing escarpment which rises to a plateau and forms part of the basin's boundary. The plateau is the highest point within the study area reaching an elevation of 4,974 feet. East of this escarpment, the plateau slopes gently toward the east for a distance of about 11 miles. This area of relatively gentle topography is broken only by a long rocky rim which forms the southern edge of the plateau.

Farther to the east, Coyote Lake is the major feature of the landscape. It is a playa that is somewhat smaller than the Alvord playa, and like the Alvord, it is usually dry. Northeast of Coyote Lake the topography is flat to gently rolling with only a few rounded ridgelines and shallow drainages to provide diversity to the landscape.

The East Alvord WSA includes the eastern edge of the Alvord Basin, the escarpment, and plateau features present in the Alvord Desert WSA. In this study area the escarpment runs roughly through the center of the WSA, dividing the plateau area on the east from the Alvord Basin on the west. Sand dunes are the primary feature of the Alvord Basin portion of the study area. Most of these dunes are stabilized with a variety of vegetation. The lowest elevation in the study area, 4,015 feet, occurs along the western side of the WSA.

In the northern portion of the WSA lies a much smaller basin. Most of this area is covered by a playa. In addition, Mickey Hot Springs are located on the northern edge of study area. The springs contain several pools of extremely hot water and, on occasion, bubbling mud holes and steam vents. One of the most interesting aspects of the hot springs area is that it seems to be constantly changing. While the major pools remain the same, the mud holes and steam vents appear to come and go or change locations with each visit to the area.

As in the Alvord Desert WSA the escarpment in the East Alvord WSA rises abruptly (from 400 to 1,100 feet) on the eastern edge of the basin to form the plateau area. The study area reaches its maximum elevation in the north-central portion of the WSA where the plateau peaks at 5,384 feet. The plateau region in the northern part of the area is somewhat flat to gently rolling and generally slopes to the south and west.

In the southern portion of the study area, the plateau region is cut by numerous intermittent stream drainages, creating an extremely diverse landscape of rounded rolling hills.

The two study areas contain a variety of plant species. The most common species found in the WSAs is big sagebrush. This shrub is found throughout most of the area east of the Alvord Desert playa. There are several places, however, where big sagebrush is not the dominant species. The sand dunes, for example, are dominated by greasewood, and this portion of the WSA has a diversity of vegetation including spiny hopsage, green rabbitbrush, shadscale, budsage, bottlebrush squirreltail, fourwing saltbush and cheatgrass. The Alvord Desert playa, Coyote Lake and the playa south of Mickey Hot Springs are completely devoid of vegetation.

Interrelationships

Four other wilderness study areas share common boundaries with the Alvord Desert and East Alvord WSAs.

On the west, the Alvord Desert study area is separated from the High Steens WSA (OR-2-85F) by a less than one-mile segment of county road. This well-used and maintained road is a major access route within the county serving a wide variety of users. The most significant interrelationship between the Alvord Desert and High Steens study area is the visual or scenic relationship. One of the attractions of the Steens Mountain summit is the view of the Alvord Desert playa over 5,000 feet below. Conversely, the dominant view from most of the Alvord Desert and East Alvord WSAs is that of the steep east-facing escarpment of Steens Mountain.

On the northeast, the Alvord Desert study area is adjacent to the Wildcat Canyon WSA (OR-2-72D). The two areas are separated by a road which is used and maintained by BLM and range users. On occasion, private landowners and recreationists also make use of this road.

Two study areas adjacent to the East Alvord WSA are Table Mountain WSA (OR-2-72I) on the north and Winter Range WSA (OR-2-73H) on the northeast. The roads separating these areas are also used and maintained by BLM and range users, with additional use by recreationists and landowners.

The Alvord Desert Area of Critical Environmental Concern (ACEC) is a 16,700-acre area on the northeastern corner of the Alvord Basin, totally encompassed by the two WSAs (see map 3). Part of the ACEC is in the west portion of the Alvord Desert WSA and part covers the southwestern corner of the East Alvord study area. The area includes a sequence of vegetation belts and is an area rich in biological diversity of both plant and animal communities of the northern Great Basin Desert. The area was designated in 1983 to protect the scientific and educational values associated with the area's vegetation and wildlife.

Some 510 acres of the 560-acre Mickey Basin Research Natural Area (RNA) is located in the northeastern corner of the East Alvord WSA with the remainder in the Winter Range WSA (see map 3). The RNA contains a stand of winterfat in good condition. The winterfat area has been set aside under this special designation in order to protect it for research and educational purposes.

The specific management objectives of these areas have not been finalized as of January 1, 1985. The areas will be managed, however, to protect their vegetative and wildlife values. This may include fencing of the perimeter of the RNA to exclude livestock and wild horses. Although the areas would not be withdrawn from mineral leasing, reasonable efforts could be made to minimize the impacts of energy exploration and development.

The special management restrictions of the Alvord Desert ACEC and the Mickey Basin RNA would continue to apply whether or not the area is designated wilderness.

The Oregon Department of Fish and Wildlife (ODFW) conducts an annual aerial census of antelope wintering east of Coyote Lake in the Alvord Desert WSA.

Part of Alvord Desert WSA and all of East Alvord WSA is in the Alvord-Tule Springs wildhorse herd management area (HMA), and the remainder of Alvord Desert WSA is in the Coyote Lake HMA. HMA management, including the use of the trap site in the Alvord Desert WSA, would not be significantly affected by any of the alternatives.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for these two WSAs include:

- potential geothermal or oil and gas development, as well as other mineral exploration and development within the areas,

- existing recreational use of the Alvord Playa by motorized vehicles or mechanical equipment,

- management of wild horses in the area (see Statewide EIS volume), and

- use of the area by military aircraft. (Military jet aircraft use the area frequently for low altitude training flights. The influence of these flights on a visitor's perception of solitude and, to some degree, naturalness, is extreme for a short period of time (1 to 2 minutes), but it is also quite temporary. These flights do not have a substantial, long lasting, adverse effect on a visitor's opportunity to find solitude.)

Also raised as an issue was the possibility of combining the adjacent WSAs in the area to form a single wilderness area, and the effect of closing roads between them. Another issue concerned whether the areas are manageable as wilderness with their present configurations.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- preferred alternative
- no wilderness/no action

The possibility of combining the Alvord Desert and East Alvord WSAs by closing the road between them is analyzed under the enhanced wilderness and preferred alternatives.

The enhanced alternative does not analyze the possible combination of the Alvord Desert and East Alvord wilderness study areas with any of the adjacent WSAs. Combining the Alvord Desert with the High Steens WSA on the west by closing the segment of road between them would not be feasible. The portion of boundary road shared by these two study areas is less than one mile in length and is part of a major county road. The road provides access to the southern end of Harney County along the east side of Steens Mountain and is well-maintained and travelled.

The possible combination of the Alvord Desert WSA with the Wildcat Canyon WSA on the northeast or of the East Alvord WSA with the Table Mountain or Winter Range WSAa on the north also are not analyzed. The Wildcat Canyon and Table Mountain study areas are separated from Alvord Desert and East Alvord study areas by the Mickey Hot Springs Road. This road is an important route which provides access to the southern end of the Sheepshead Mountains area, as well as the eastern portions of the Alvord Desert region. The road is used primarily by grazing operators for checking livestock and range developments, but also used by BLM personnel, recreationists, and private landowners.

Another road separates East Alvord from the Winter Range WSA. Although this road does not receive a significant amount of use at this time, a road closure proposed in the enhanced and preferred alternatives would shift some use by the rancher to this boundary road, thereby increasing the need to leave this road open for access. In addition, closing any of these roads and combining the study areas would not significantly enhance the manageability or wilderness qualities of these WSAs.

All Wilderness

The all wilderness alternative would recommend all 111,690 acres of public land in the Alvord Desert WSA and all 21,600 acres of public land in the East Alvord WSA suitable as wilderness (see map 2). The road between the WSAs would remain open, and the two areas would be managed as two separate wilderness areas.

For purposes of analysis, it is assumed that none of the split-estate inholdings within either WSA would be acquired. The dead-end roads which enter the Alvord Desert study area would remain open.

Enhanced Wilderness

Under the enhanced wilderness alternative, part of the Alvord Desert WSA (93,620 acres) and all of the East Alvord WSA (21,600 acres) would be combined and a total of 115,220 acres of public land would be recommended suitable for wilderness designation (see map 4). This alternative would also recommend closure of the 12-mile section of road which separates the two study areas. The six dead-end roads which penetrate the Alvord Desert WSA would also be closed.

An attempt would be made to acquire 6,520 acres of split-estate land both within the two study areas and adjacent to the boundary. A small portion of private land, about 50 acres in the northern portion of the East Alvord WSA near Mickey Hot Springs, is also recommended for acquisition. The 11 parcels of split-estate land and one parcel of private land could be acquired through purchase or exchange with willing landowners.

Assuming acquisition of these lands, total area recommended suitable under this alternative would be 121,790 acres.

This alternative would recommend 18,070 acres nonsuitable for wilderness, all of it within the Alvord Desert WSA.

Under the enhanced wilderness alternative, the northern, eastern and southern boundaries of the Alvord Desert WSA would remain virtually the same. The acquisition of split-estate boundary parcels, closure of 9 miles of dead-end road and 12 miles of road between this study area and the East Alvord WSA would be the only changes to these boundaries.

On the western side of the Alvord Desert WSA, 18,070 acres of the Alvord Playa would not be recommended as suitable for wilderness. The boundary on this side of the study area would follow the eastern edge of the playa where very small, slightly vegetated mounds, known as greasewood hummocks, begin to appear on the landscape. The hummock area roughly marks the edge of the flat playa and is also the western boundary of the ACEC.

The playa portion of the WSA would not be suitable for wilderness because it could not be managed to control the existing recreational use it receives: off-road vehicles and other forms of mechanized equipment such as sail planes (gliders) and land sailers.

The boundary for the western side of the area under the enhanced wilderness alternative could also be difficult to manage because of the lack of physical barriers.

Except for acquisition of the small parcel of private land along the northern boundary and closure of the southern and western boundaries to merge the two study areas, there would be no changes in the boundary recommended for the East Alvord WSA under this alternative.

In combining the two study areas, the enhanced alternative would improve the manageability of the areas by closing roads (including dead-end and boundary roads) and acquiring land. The road closures would improve manageability by eliminating or reducing the amount of vehicle use within the area. This would also improve the naturalness, solitude and recreation qualities of the area.

The acquisition of the split-estate and private lands would improve manageability by eliminating the possibility of development and the potential need for access to those parcels. Although no development is planned at this time, several of the parcels proposed for acquisition are in an area with high potential for occurrence of geothermal resources and moderate potential for oil and gas.

Land uses which could occur on those portions of the Alvord Desert study area not recommended for wilderness would be the same as under the no wilderness/no action alternative.

Preferred Alternative

Under the preferred alternative, parts of each WSA would be combined and a total of 79,555 acres of public land would be recommended suitable for wilderness (64,410 acres in the Alvord Desert WSA and 15,145 acres in the East Alvord WSA) (see map 5). Under this alternative 53,735 acres would be recommended nonsuitable for wilderness: 47,280 acres in the Alvord Desert study area and 6,455 acres in the East Alvord area.

The preferred alternative also recommends closure of 9 miles of road separating the two study areas. Two dead-end roads, totaling 3 miles, within the Alvord Desert WSA would be closed in this alternative, and an attempt would be made to acquire 9 parcels of split-estate land totaling 5,075 acres. As with the enhanced alternative, the split-estate land could be acquired through purchase or exchange with a willing landowner and the vehicle use of the roads would be allowed only if there were no practical alternative for grazing management.

Assuming acquisition of these lands, total area recommended suitable under this alternative would be 84,630 acres.

Boundary adjustments would be made to both study areas under this alternative. As with the enhanced alternative, the western side of the Alvord Desert WSA (the playa) would not be recommended as suitable for wilderness. The boundary for this part of the study area would also be the western side of the Alvord Playa where the vegetation begins in the greasewood hummocks. The playa would not be recommended suitable; it would not be manageable, because of conflicts with existing recreation use, and because of conflicts with potential geothermal resource values.

The boundary in the northwestern portion of both study areas would follow legal subdivisions and would conform with the boundary of the Alvord KGRA (Known Geothermal Resource Area, see Energy and Minerals section). This portion of the two study areas would be recommended as nonsuitable for wilderness because of conflicting geothermal resource values and the potential for manageability problems with existing geothermal leases.

The eastern boundary of the East Alvord WSA and the north central boundary of the Alvord Desert study area would not be changed. However, in the northeastern portion of Alvord Desert area the boundary would follow the road leading from Ancient Lake Well to Coyote Lake. The boundary would then skirt the eastern edge of Coyote Lake and join the small section of road which exits from the southeastern corner of the lake.

The 24,665 acres on the northeastern corner of the WSA would not be recommended for wilderness because of the limited number and variety of wilderness values in this portion of the area. Although there are opportunities for solitude with this corner of the study area, there are no outstanding opportunities for recreation and there are no known special features.

From Coyote Lake west, the southern boundary of the area would not be changed except for the acquisition of parcels of split-estate land.

On the southwest, the boundary would be adjusted slightly to conform with the Sand Gap road and vehicle way. As a result, 2,220 acres of federal land would be recommended as nonsuitable for wilderness. Part of this area is in the Alvord KGRA. The remainder does not contain any substantial wilderness values. The boundary in this part of the study area would follow the road and way instead of legal subdivisions, making it more identifiable.

A variety of land uses could occur within the areas recommended as nonsuitable for wilderness, including vehicle-oriented recreation (primarily on the playa in the western portion of the Alvord Desert WSA), and geothermal and oil and gas exploration and development.

No Wilderness/No Action

The no wilderness/no action alternative would recommend both WSAs nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- construction of proposed livestock and wildlife improvement projects, including fencing and guzzlers (wildlife watering devices) and the proposal to fence the Mickey Basin RNA to exclude livestock and wild horses;

- continued vehicle-oriented recreational use of the Alvord Playa and vehicle use of the other playa areas, Coyote Lake and the northern portion of the East Alvord WSA (current use of these areas for vehicle-oriented recreation is limited); and

- continued availability for geothermal and oil and gas exploration and development.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Areas as Wilderness

With the exception of the Alvord Desert Playa, both the Alvord Desert and East Alvord wilderness study areas are manageable as wilderness under the all wilderness alternative. Manageability problems could occur, however, due to the presence of split-estate inholdings, mineral leases which could be developed before or after designation, and the large amount of unmarked private and split-estate land which forms part of the Alvord Desert WSA boundary.

Table 1. Summary of Proposed Management Under Each Alternative, East Alvord (OR-2-73A) and Alvord Desert (OR-2-74) WSAs

Proposed Management	All Wilderness	Enhanced Wilderness	Preferred	No Wilderness/ No Action
Acres Designated as Wilderness	133,290	115,220	79,555	0
Acres Closed to ORVs by Wilderness Designation	133,290	115,220	79,555	0
Miles of Roads Closed	0	21	12	0
Miles of Ways Closed	24	24	8	0
Acres of Full Fee Estate Acquired [1]	0	50	0	0
Acres of Split Estate Acquired [1]	0	6,520	5,075	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	133,290	115,220	79,555	0
Structural Wildlife Projects Developed: Catchments and Guzzlers (number)	0-2	0-2	2	2
Structural Livestock Projects Developed: Fences (miles)	0-4	0-4	0-4	4
Unallocated Existing Forage Allocated (AUMs)	0-6,909	0-6,909	0-6,909	6,909

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

Table 2. Summary of Environmental Consequences of Alternatives, Alvord Desert WSA (OR-2-74) and East Alvord WSA (OR-2-73A)

Resource or Activity	All Wilderness	Enhanced Wilderness	Preferred Alternative	No Wilderness/No Action
Wilderness Values	Would add 111,690 acres in Alvord Desert WSA and 21,600 acres in East Alvord WSA to NWPS as two separate wilderness areas. Maintain present or improved level of quality for wilderness characteristics and protect the areas' special wilderness features, including Alvord Desert playa and the wildlife, scenic, and geologic values associated with the area. Closure of 24 miles of ways would enhance wilderness values. If minerals in inholdings were developed or access routes to inholdings were constructed, wilderness values on surrounding public lands would be impaired. The areas are manageable as wilderness except for the Alvord Desert playa which is unmanageable.	Would combine a portion of Alvord Desert and all of East Alvord WSAs into one wilderness (93,620 acres in the Alvord Desert WSA and 21,600 acres in the East Alvord WSA) and add 121,790 acres to NWPS, assuming acquisition of 6,570 acres of split-estate and private land. Closure of 24 miles of ways, 12 miles of road between the WSAs,and 9 miles of dead-end roads would enhance wilderness values. Area recommended as nonsuitable includes the Alvord Desert Playa. Acquisition of private and split-estate land would preclude development on those parcels, as well as need for access, maintaining naturalness of the area. Improves manageability by recommending unmanageable areas as nonsuitable. The area recommended as nonsuitable subject to vehicle-oriented recreation and geothermal development, which could adversely affect wilderness values.	Would combine portions of both WSAs into one wilderness (64,410 acres in Alvord Desert WSA and 15,145 acres in East Alvord WSA) and add 84,630 acres to NWPS, assuming acquisition of 5,075 acres of split-estate land. Maintain wilderness characteristics and special wilderness features of this area. The area recommended as suitable is manageable as wilderness. Closure of 8 miles of ways, 9 miles of the road between the WSAs and 2 dead-end roads (3 miles) would enhance wilderness values. 53,735 acres recommended nonsuitable for wilderness, including the Alvord Desert Playa, Mickey Hot Springs area, and the northeastern and southwestern corners of the Alvord Desert WSA, subject to uses not compatible with wilderness. Grazing would be the primary use in the northeastern corner, and geothermal development and vehicle-oriented recreation the primary use occurring around Mickey Hot Springs and the Alvord Desert Playa. These uses could adversely affect wilderness values.	Wilderness values and special wilderness features subject to disturbance from possible energy or other resource development.
Energy and Mineral Development	Development precluded on 111,690 acres of the Alvord Desert WSA including 111,690 acres with moderate potential for oil and gas, 32,730 acres with high potential and 56,055 with moderate potential for geothermal resources, and 26,940 acres with moderate potential for diatomite. Development also precluded on 21,600 acres in the East Alvord WSA, including 21,600 acres with moderate potential for oil and gas, 9,270 acres with high potential and 12,330 with moderate potential for geothermal resources, and 920 acres with moderate potential for diatomite.	Development precluded on 115,200 acres, plus an additional 6,570 acres of split-estate and private land, if acquired. This includes a total of 115,220 acres with moderate potential for oil and gas, 24,080 acres with a high potential and 68,385 acres with a moderate potential for geothermal resources, and 27,860 acres with a moderate potential for diatomite.	Development precluded on 79,555 acres, plus an additional 5,075 acres of split-estate land, if acquired. This includes 79,555 acres with moderate potential for oil and gas, 13,930 acres with a high potential and 65,325 acres with a moderate potential for geothermal resources and 25,450 acres with a moderate potential for diatomite.	No impact.
Wildlife	Wildlife habitat preserved. Opportunity to provide additional water sources for wildlife resulting in slight increases in wildlife numbers might be foregone.	Same as all wilderness in suitable area.	Same as enhanced wilderness in suitable area. In nonsuitable area, wildlife guzzlers would be built, benefiting wildlife, primarily antelope. Slight increases in numbers might be realized.	No significant impact. Wildlife guzzlers would be built, benefitting wildlife, primarily antelope. Slight increases in numbers might be
Livestock Grazing	Proposed fence may be precluded and the opportunity to increase licensed use by up to 750 AUMs through management may be foregone. Proposed allocation of 6,909 AUMs of available forage in pastures in the Alvord Desert WSA might be foregone. No significant impact on livestock management due to closure of vehicle ways.	Same as all wilderness, except there would be inconvenience to grazing operators from closure of the boundary and dead-end roads.	Same as enhanced wilderness.	Proposed fence would be built, resulting in a potential increase of licensed use by up to 750 AUMs. Allocation of 6,909 AUMs of existing forage in pastures in Alvord Desert WSA realized.

Resource or Activity	All Wilderness	Enhanced Wilderness	Preferred Alternative	No Wilderness/No Action
Recreation Use	Use of motorized vehicles restricted to dead-end and boundary roads. Some net decline in overall recreation use due to elimination of ORV use on the Alvord Desert Playa. Slight increase in recreation use possible if guzzlers built.	Vehicle-oriented recreation eliminated in area recommended suitable, but this would be a slight effect as little use occurs there now. ORV use could continue on Alvord Desert Playa. Slight increase in recreation use possible if guzzlers built. No change in overall recreational use.	Same as enhanced wilderness.	No impact. Slight increase in recreation use possible from construction of guzzlers.
Economic Value and Local Income	Decrease in economic value and local personal income by $91,580 and $27,279 respectively, if proposed projects and grazing increases are not allowed. Decrease in economic value by $34,582 and increase in local personal income by $36,961 if proposed projects and grazing increases are allowed.	Decrease in economic value and local personal income by $69,498 and $19,011 respectively, if proposed projects and grazing increases are not allowed. Decrease in economic value by $12,500 and increase in local personal income by $45,229 if proposed projects and grazing increases are allowed. The maximum increase in transportation costs to ranchers with grazing permits would be $68.	Decrease in economic value and local personal income by $38,413 and $11,548 respectively, if proposed projects and grazing increases are not allowed. Increase in economic value and local personal income by $18,585 and $52,692 respectively, if proposed projects and grazing increases are allowed. The maximum increase in transportation costs to ranchers with grazing permits would be $68.	Increase in economic value and local personal income by $56,998 and $64,240 respectively.

The Alvord Desert Playa could not be managed as wilderness under the all wilderness alternative. This large, flat lakebed is a traditional recreation vehicle use area. It has a number of access points and virtually no physical barriers which could be used as boundaries to preclude vehicle use. Because access to the area could also be gained by crossing private land, restricting the use of the area to only wilderness visitors would be nearly impossible.

Management problems could occur under the all wilderness alternative due to the presence of scattered, unmarked, split-estate inholdings. If they were to be developed these parcels could present problems in managing the area as wilderness. All of these parcels, in both study areas, lie within an area which has moderate favorability for the occurrence of oil and gas resources while parcels on the western sides of the WSAs have high favorability for geothermal resources. Depending on the location and size of any possible development and the need for access, maintaining wilderness values could be difficult.

Two geothermal leases in the northern portions of both study areas were issued before the passage of the Federal Land Policy and Management Act in 1976 and do not have wilderness protection stipulations. The leases could be developed either before or after the area was designated wilderness. Such disturbance would create problems with managing the area as wilderness.

The large amount of private and split-estate land, which bounds the study areas, could cause manageability problems. Most of these lands are unfenced or unmarked and the boundaries are not easily recognized.

The enhanced and preferred alternatives would be manageable as wilderness, but could also have some of the same problems. The management of recreation vehicles on the Alvord Playa would not be a factor with either of these alternatives as that portion of the Alvord Desert study area is not recommended for wilderness.

Some manageability problems could arise, however, with the proposed western boundary, because the area is accessible to vehicles using the playa. Potential problems with vehicle use probably would not be significant because this area is away from the higher concentrations of vehicle use.

The presence of split-estate inholdings would not be a problem under the enhanced wilderness or preferred alternatives if the parcels were acquired as proposed.

As with the all wilderness alternative, adjacent private or split-estate lands could cause some manageability problems under both the enhanced wilderness and preferred alternatives. Although not expected to be a significant problem under any alternative, the enhanced and preferred alternatives reduce the amount of this adjacent private and split-estate land by recommending the Alvord Desert Playa as nonsuitable for wilderness. The preferred alternative further reduces the amount of adjacent split-estate land by recommending the northeastern portion of the Alvord Desert WSA as nonsuitable for wilderness.

Potential manageability problems from existing mineral leases would be eliminated in the preferred alternative as these are not within the area recommended for wilderness. The leases are within the area recommended as suitable for wilderness in the enhanced alternative and could result in management problems in the northern portions of both study areas.

Rationale for Selection of the Preferred Alternative

Portions of the Alvord Desert and East Alvord WSAs were recommended as suitable for wilderness after an analysis of how much they would add to the diversity of ecosystems in the NWPS. This criterion was not applied in the first phase of the wilderness studies--the preparation of management framework plans (MFPs)--because the MFPs were prepared on a district-by-district basis.

From that geographical perspective, it would have been difficult to judge whether adding a particular WSA to the NWPS would add significantly to the diversity of ecosystems in the system. This judgment would be better made at the statewide level, where ecosystems in a WSA could be considered along with those in other WSAs and wilderness in the state and in adjacent states. Therefore, the ecosystem diversity criterion was applied when the Statewide EIS was prepared.

The preliminary recommendation in the management framework plan was that the Alvord Desert and East Alvord WSAs be considered nonsuitable for wilderness. However, the preferred alternative in this draft EIS is that portions of both WSAs be recommended as suitable for wilderness. The preliminary recommendation was changed because the WSAs contain assemblages of ecosystems not found in other WSAs recommended as suitable for wilderness.

The area recommended suitable for wilderness contains over 75,000 acres within two study areas. The wilderness would include the eastern edge of the Alvord Basin, a large west-facing escarpment, plateau land and a playa lake bed at Coyote Lake on the extreme eastern edge of the area.

The area recommended as suitable for wilderness has only a few man-made features. The influence of these features on the natural qualities of the area is minimal. By virtue of its size alone, the area has outstanding opportunities for solitude. Other features such as the large escarpment in both WSAs and the area of rolling hills in the southern portion of the East Alvord study area also make substantial contributions to the opportunities for finding solitude.

Opportunities for participating in primitive and unconfined types of recreation are also outstanding within the area recommended as suitable. Recreational activities such as day hiking, sightseeing, viewing and studying desert plant and animal life, and photography are available.

The area recommended as suitable also contains several special wilderness features. These features include a large area of diverse plant and animal communities of the northern Great Basin desert, several plant species of special interest, a community of winterfat, scenic values, geological features and cultural resources.

Wilderness designation of the area recommended suitable would protect wilderness values and special features within an area which is capable of being managed as wilderness. The suitable area is not without conflicts, however. The western edge of the suitable area contains a portion of the Alvord KGRA and is within an area which has high favorability for the occurrence of a geothermal resources. Other portions of both study areas have moderate favorability for geothermal resources. The entire area recommended as suitable has also been identified as having moderate favorability for the occurrence of oil and gas.

Despite these conflicts, designation of the areas as wilderness is the most appropriate use of the land. The wilderness values associated with these portions of the Alvord Desert and East Alvord wilderness study areas outweigh the potential benefits to be gained from energy resource development.

Portions of the two study areas were recommended as nonsuitable for wilderness because of potential problems in managing the area as wilderness or because the benefits of preserving options for resource development outweigh the benefits of preserving the limited number of wilderness values in the area. The western portion of the Alvord Desert study area, the playa, is not manageable as wilderness because it would be difficult or impossible to control the existing vehicle-oriented recreation use the area receives.

The northern portions of both study areas have significant potential for geothermal resource exploration and development, and the value of preserving the option of geothermal development outweighs the benefits to be gained from preservation of wilderness characteristics. This part of the two study areas could also have manageability problems if existing geothermal leases were developed.

The northeastern portion of the Alvord Desert WSA offers outstanding opportunities for solitude but no other significant wilderness values. Because of the limited number and variety of wilderness values, the benefits of leaving the area open for development of resources would outweigh the value of preserving wilderness characteristics. There are no plans or proposals for resource development at this time, but the area is rated moderately favorable for the occurrence of oil and gas.

Affected Environment

This section discusses only those activities or resources which influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Alvord Desert and East Alvord WSAs appear to be in a natural condition. There are few man-made features and they are relatively unnoticeable.

The Alvord Desert study area contains 2 reservoirs, 5 wells, a horse trap, 3 fences totaling 16 miles and 8 vehicle ways (vehicle routes established and maintained solely by the passage of vehicles) totaling 21 miles. These developments have a minor visual influence due to the terrain within the study area. Much of the area is relatively flat to gently rolling so most developments are not visible from the surrounding terrain. Overall, the combination of gentle terrain and relatively few developments substantially lessens the impact of the developments on the natural character of the area. Less than 2 percent of the study area is influenced by these features. (The area of influence is an estimate of the acreage within the WSA from which these man-made features can be seen.)

The water developments which occur within the WSA are scattered. The largest concentration of developments occurs along the northern boundary road, where there are 3 wells and a reservoir. These are not large developments and they have a minor influence on the area.

Along the southern boundary, there is also a well and a reservoir, and the remaining well is located in the northeastern corner of the WSA. Both of these wells were once wind-powered and are not working at this time. These three developments have a minimal effect on the area.

The remaining developments are 3 sections of BLM's district boundary fence, in the eastern and southern part of the WSA. These are not easily viewed and have a minor influence on the area.

The horse-trap site is located just east of the district boundary fence west of Coyote Lake. This site consists of rock jacks and vehicle tracks and is visible from the higher terrain to the west. The overall influence, however, is minimal.

The study area's gentle terrain plays an important role in reducing the effects of the 21 miles of ways. Due to the topographic and vegetative screening, the vehicle ways are not noticeable developments.

The most substantial source of outside sights and sounds is the boundary roads. Overall, these have a minor influence. They are not easily viewed and they are only lightly travelled. Other sources of outside sights and sounds are 3 wells, a reservoir, and ranching activities associated with Alvord Ranch to the west.

East Alvord WSA contains 11 man-made features. Eight of the developments are reservoirs, one is a well and reservoir combination, and 2 are vehicle ways totaling 3 miles. It is estimated that approximately 3 percent of the area is influenced by these features.

The water developments are scattered around the perimeter of the WSA. They are relatively minor disturbances, and because of their locations in small shallow drainages, each has a limited influence on the natural qualities of the area.

The way in the northwest corner is not easily viewed except in the immediate vicinity. It is located in flat terrain away from any higher areas which would provide views of the development, and it is somewhat screened by the surrounding vegetation. The other way is longer and located in the bottom of a drainage. It can easily be viewed from the adjacent higher terrain. This way tends to blend in with the drainage course and is also slightly screened by vegetation. In several places, the trail seems to receive more use from livestock and wild horses than from vehicles. In addition to these identified ways, there are additional vehicle tracks in the northwestern corner which are the result of occasional off-road vehicle use. These tracks do not influence the naturalness of the area.

Outside sights and sounds have a minor effect on the wilderness values. There are seven water developments and 31 miles of boundary roads.

Opportunities for Solitude and Primitive and Unconfined Types of Recreation

The Alvord Desert WSA and the East Alvord WSA have outstanding opportunities for solitude. The Alvord Desert WSA is very large and would give a feeling of vastness to any wilderness visitor. The East Alvord WSA is not as large but is adequate to provide solitude. The topography of both WSAs consists of flat to gently rolling terrain surrounded by lava cliffs and plateaus. The ridgelines and cliffs provide some topographic screening. The type of vegetation in both WSAs does not screen wilderness users from each other.

Opportunities for primitive recreation in the Alvord Desert and East Alvord study areas are outstanding. The primitive recreation activities include day hiking, backpacking, camping, horseback riding and sightseeing.

Opportunities for day hiking are outstanding in both WSAs. In the Alvord Desert WSA, the opportunities for day hiking are best in the western and central portions of the area. The primary day hiking attractions probably would be the Alvord Desert playa and basin area, the plateau area east of the Alvord, and the Coyote Lake area. Also of interest to the day hiker are the expansive views and open space available throughout the entire WSA.

In the East Alvord WSA opportunities for hiking are not as outstanding, but the topography of the area is diverse and offers a variety of country for hiking. Mickey Hot Springs and the sand dunes, only short distances from the western boundary, would be of interest to the hiker. The rest of the WSA probably does not have enough attractions to draw a substantial amount of day visitors.

There are opportunities for backpacking and camping in both WSAs. However, Alvord Desert WSA offers greater opportunity due to its larger size and more numerous attractions. Day hiking could easily be extended into an overnight trip. The attractions mentioned for day hiking are also likely to be most attractive to the backpacker. In Alvord Desert WSA, the size of the study area would also attract hikers looking for an extended trip.

Both WSAs provide ample opportunities for level campsites and relatively easy hiking; but there is a lack of water throughout the entire area.

Opportunities for horseback riding are similar to those for backpacking. The gentle terrain, with the exception of the escarpment, and the size of the two areas allow virtually unlimited use. However, as with backpacking, the major deterrent to horseback riding would be the general lack of water throughout the WSAs.

Opportunities for sightseeing and photography are excellent in both WSAs, including background views of the Steens and Sheepshead Mountains. Other background views outside the WSAs, though less dominant, include the Pueblo and Trout Creek Mountains as a panorama to the south. In the East Alvord WSA, outside scenic views also include vistas of the Alvord Desert and the vast open expanse of land to the east, including Coyote Lake.

Within the Alvord Desert WSA are impressive views of the Alvord Playa, the escarpment and plateau area, and the vastness of the open space associated with the general area. The number of opportunities for photographing and viewing typical desert wildlife and plants are particularly high along the eastern portion of the Alvord Basin and in the Coyote Lake area. A visitor might also have an opportunity to view and photograph wild horses.

Special Features

There are several special features of the Alvord Desert and East Alvord WSAs which enhance the value of the area as wilderness. Geology, vegetation, wildlife and scenic quality are special features of both WSAs. Cultural resources are found primarily in the Alvord Desert Study Area.

The geology of this area is not unique to the Great Basin, but it is not common in Oregon and would be of interest to the wilderness visitor. Most of the geologic features of interest are in the western portion of the WSAs. The most significant feature of the area is the Alvord Desert. This area is roughly defined as the large basin between the Steens Mountain on the west and a prominent ridgeline on the east. This basin is a structural graben (sunken area) bounded by fault zones and their associated escarpments (including the Steens and the ridgeline on the east). The dominant feature of this basin is the intermittently dry lakebed (playa).

Mickey Hot Springs is located in the northern part of the East Alvord study area. This is one of the hottest springs in BLM's Burns District, reaching temperatures of up to 210°F. Also associated with the springs are a variety of mud pots and steam vents. The location of the mud pots and vents appears to change frequently because of changes in hydrothermal activity. This site is unique within the Burns District and represents a definite attraction in the WSA.

The most significant vegetative features of the area occur on the eastern side of the Alvord Basin, where the Alvord Desert ACEC has been designated to protect both vegetation and wildlife values. The ACEC runs from the eastern edge of the playa to the top of the plateau to the east and is distinctive due to the diversity of habitats within a small area. This diversity is the result of differences in topography, alkalinity, moisture and soil.

The East Alvord WSA also contains 510 acres of the 560-acre Mickey Basin RNA, which provides management and protection for a *Eorotia laucta* (winterfat) community of a size and condition which is uncommon in Oregon.

Other special vegetation features include three plant species of special interest which have been identified in the Alvord Desert WSA. (The Vegetation section further discusses these plants.)

The Alvord Desert and East Alvord WSAs also support a unique variety of reptiles and small animals; most are found within the ACEC. Also of importance to the entire area is the presence of kit fox habitat. These WSAs are within the northernmost range of this species, which is on the Oregon State Department of Fish and Wildlife's List of Threatened Species. The snowy plover, also on the Department's List of Threatened Species, nests along the east edge of the Alvord Playa. (The wildlife section provides more information on the animal life of the area.)

Both WSAs contain cultural resources. Those in the Alvord Desert WSA are especially noteworthy. They reflect prehistoric Indian adaptations to environments that have long since disappeared. (See Cultural Resources section for more information.)

Scenery in portions of both WSAs is outstanding, including the entire western portion of both WSAs from the major ridgeline east of the Alvord Desert playa west to the base of the Steens. The Alvord Desert playa, the sand dunes, and the ridgeline combine to create outstanding contrasts in color, landform, and vegetation.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the Alvord Desert and East Alvord WSAs are in the Intermountain Sagebrush Province, and the potential natural vegetation is saltbush-greasewood.

The Basin and Range section of the Oregon Natural Heritage Plan identifies ten ecosystems which occur in these WSAs. Eight of them are common to both WSAs. The upland communities are big sagebrush/spiny hopsage, shadscale-spiny hopsage-budsage community complex, and big sagebrush/bluebunch wheatgrass. Communities in the alkaline areas are bare playa and playa margin communities, greasewood/saltgrass, big sagebrush/greasewood, Great Basin wildrye community, and a sand dune series (beachridges) from active unvegetated dunes through completely stabilized dunes. The East Alvord WSA also has a winterfat community. A black sagebrush community complex occurs in the Alvord Desert WSA.

The study areas are within 5 hours' driving time of one standard metropolitan statistical area: Boise, Idaho.

Energy and Mineral Development

The geology, energy and mineral resources of the Alvord Desert and East Alvord wilderness study areas were evaluated by interpreting existing literature, reviewing mining and mineral leasing records, and correlating rock units in these WSAs with similar units in areas known to contain mineral resources. Technical details of the evaluation are in a mineral resources assessment report on the Alvord Desert Geologic Resource Area (GRA OR-023-19), Harney County, Oregon, prepared by a BLM contractor, and in a BLM report on the South Harney GRA.

The WSAs are within the geologic resource areas, which have been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

Both WSAs are rated moderately favorable for the occurrence of oil and gas. The rating is based on the possible presence of favorable source and host rocks beneath the thick volcanic and sedimentary cover. There were 55,510 acres under 22 oil and gas leases in the Alvord Desert WSA, as of January 1, 1984, and eight oil and gas leases covered 19,390 acres in the East Alvord WSA.

The south edge of the East Alvord WSA and portions of the Alvord Desert WSA are rated moderately favorable for the occurrence of diatomite in tuffaceous lakebed sediments. Similar geologic units in other Tertiary basins in southeastern Oregon are known to contain diatomite deposits.

Aside from potential road aggregate sources, the principal known mineral resources within these WSAs are geothermal resources. The western portions of both WSAs lie within the Alvord Known Geothermal Resource Area (KGRA, a federally defined area with specific boundaries within which geothermal resources are known to exist). Following a legal subdivision at the base of the escarpment, the KGRA boundary covers nearly all of the Alvord Desert Basin including all of the Alvord playa and the basin area in the northern portion of the East Alvord WSA. About one quarter of each WSA falls within the KGRA boundary.

These portions of the WSAs are considered to have a high favorability for geothermal potential. (The area rated high for geothermal resources within the WSA, roughly encompasses the portion of the KGRA in the study area, although the KGRA boundary follows legal subdivisions.) Indications for the occurrence of this resource in the WSAs include relatively young volcanics, hot springs, associated faults, and high heat flow. The Mickey Hot Springs area is estimated to have potential for generating up to 160 megawatts per year for 30 years. The remainder of the East Alvord WSA and the central portion of the Alvord Desert study area has moderate favorability for geothermal resources.

In the Alvord Desert WSA, as of January 1, 1984, there were four geothermal leases covering 2,520 acres. There were five geothermal leases, covering 5,820 acres in the East Alvord WSA.

Table 3 shows the mineral potential classifications for the WSA. Map 5 shows the portions rated high and moderate (medium) for geothermal resources, including the boundary of the KGRA, and the area rated moderate (medium) for diatomite.

No mining claims were present in either WSA, as of January 1, 1984.

Surface rocks in the WSAs are Tertiary and younger volcanic and sedimentary rocks. These consist predominantly of basalt and andesite flows, welded tuffs, and sedimentary deposits of clay, silt, sand and gravel, mostly in the form of unconsolidated

Table 3. Classification of Energy and Mineral Potential, Alvord Desert WSA (OR-2-74) and East Alvord WSA (OR-2-73A).

Commodity	Area	Classification Level	Confidence Level
Metals	All of both WSAs	2	B
Geothermal	Part of both WSAs (see map 5)	4	D
	Part of both WSAs (see map 5)	3	B
	Remainder of area	1	B
Uranium/Thorium	All of both WSAs	1	A
Coal	All of both WSAs	2	C
Oil/Gas	All of both WSAs	3	B
Tar Sands/Oil Shale	All of both WSAs	1	C
Limestone	All of both WSAs	1	C
Bentonite	Part of both WSAs (not shown on map)	2	C
	Remainder of area	1	B
Diatomite	Part of both WSAs (see map 5)	3	B
	Part of both WSAs (not shown on map)	2	C
	Remainder of area	1	B
Zeolites	All of both WSAs	2	C

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

alluvium and colluvium, and playa deposits.

Vegetation

The most extensive community in the Alvord Desert and East Alvord WSAs is a complex where a big sagebrush/bunchgrass community and a shadscale/budsage community are intermittently dominant. This complex occurs across the upland portions of the WSAs. These communities occur both independently and intermixed, but characteristics of these communities are the same in either case.

The big sagebrush/bunchgrass community is the most dominant community. It occurs in the non-saline basins and alluvial bottoms as well as in the uplands. At the highest elevations, bluebunch wheatgrass occurs. The estimated successional stage is mid-seral. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) Climax vegetation is big sagebrush, spiny hopsage, Indian ricegrass, and squirreltail. Bluebunch wheatgrass is the climax grass species at the higher elevations.

The shadscale/budsage community occurs in a band on the north side of Coyote Lake and near the Alvord Desert as well as in the complex. The estimated successional stage is early to mid-seral. The primary climax species are shadscale, budsage, and Indian ricegrass.

A greasewood/saltgrass community exists in the low elevation alkaline sites on the east side of the Alvord Desert, around Coyote Lake, near Lower Willow Creek Well and Waterhole and along the other smaller playas. The estimated successional stage is early to mid-seral. The climax community contains alkali sacaton and Great Basin wildrye with some greasewood and saltgrass.

In the Alvord Desert WSA, a Great Basin wildrye community occurs in conjunction with the greasewood/saltgrass community. The estimated successional stage is early to mid-seral. The primary climax species is Great Basin wildrye. Big sagebrush and squirreltail are also present in the climax community.

Sand dunes and areas overblown by sand occur along the eastern edge of the Alvord Desert in both study areas, and around Coyote Lake in the Alvord Desert WSA. The vegetation on the dunes is greasewood, spiny hopsage, fourwing saltbush, cheatgrass, Indian ricegrass, saltgrass, and thickspike wheatgrass. Big sagebrush is also common, particularly on the overblown areas. The estimated successional stage is mid-seral. The climax vegetation is big sagebrush, fourwing saltbush, Indian ricegrass, needle-and-thread grass and saltgrass.

In the East Alvord WSA, there are some very small areas containing a community of winterfat. The climax vegetation is primarily winterfat. Nuttal's saltbush, Indian ricegrass, creeping wildrye, and squirreltail also occur in the climax community but in very minor amounts. The Mickey Basin RNA provides management and protection for a winterfat community in this WSA.

A community present in only small amounts in the Alvord Desert WSA is black sagebrush/bunchgrass. It is more extensive outside the WSA. The estimated successional stage is mid-seral. The climax community contains black sagebrush, Sandberg's bluegrass and squirreltail.

The Alvord Desert ACEC provides protective management for many of these communities, including those within the WSAs. Those in the ACEC are the sand dune communities, playa and playa margin communities, greasewood-saltgrass, big sagebrush-spiny hopsage, and shadscale-budsage complex.

Three plant species of special interest (mentioned in the Special Features section) occur in the Alvord Desert WSA: *Astragalus solitarius* (solitary milk-vetch) and *Lepidium davisii* (Davis' pepper cress), which are candidates for Federal listing as threatened or endangered; and *Allium lemnonii* (Lemmon's onion), which is on List 2 of the Oregon Natural Heritage Plan's "Rare, Threatened, and Endangered Plants and Animals of Oregon".

Wildlife

With the exception of reptiles and small rodents, the wildlife using the area has limited diversity. This is primarily due to a lack of water sources. Most of the reptiles found in the northern Great Basin are present. Common reptiles include side-blotched lizard, sagebrush lizard, western fence lizard, western whiptail lizard, leopard lizard, collared lizard, desert horned lizard, great basin rattlesnake, yellow-bellied racer and striped whipsnake.

Bird diversity in the area is low, which is characteristic of Upper Sonoran shrub habitats. Black-throated sparrow, horned lark, sage thrasher, sage sparrow, and loggerhead shrike are common species. Prairie falcon, golden eagle, and raven are common raptors.

Chuckars are found near rimrocks, but are not abundant. Other species using rimrocks include bushy-tailed woodrats, little brown myotis (bat), bobcat and nesting raptors.

The Alvord playa and the other playas in the WSAs are occasionally flooded during spring and early summer and receive light use by migrating waterfowl and shorebirds. Coyote Lake is also seasonally flooded and is used by shorebirds, such as American avocets. Waterfowl and shorebirds use the small ponds near Mickey Hot Springs.

Snowy plover, on Oregon Department Fish and Wildlife's (ODFW) List of Threatened Species, nests along the east edge of the Alvord playa, near the Alvord Ranch and near Alvord Hot Springs. Avocets also use this area. Killdeer, common snipe, yellow warblers, marsh hawks, montane meadow mice, and Belding's ground squirrels use the meadows and seeps found along the west edge of the Alvord playa.

Dunes along the east side of the Alvord playa provide habitat for mammals such as antelope ground squirrels, least chipmunks, dark kangaroo mice and Ord's kangaroo rat. Black-throated sparrows are a common songbird of the dunes.

Few deer use the area and most of this use is along the west boundary near the Alvord Ranch. Antelope utilize the eastern half of the Alvord Desert WSA during the winter. Over 340 antelope have been counted within the Malheur County portion of the WSA during the winter.

Northern kit fox, a species once thought to be extirpated from Oregon, are present in the area. ODFW considers the kit fox threatened in Oregon.

The Alvord Desert ACEC contains many species which are uncommon in the area. Eleven reptiles and twenty mammals have been found within the ACEC. The notable mammals include Kit fox, dark kangaroo mouse, little pocket mouse, grasshopper mouse, white-tailed antelope ground squirrel and Merriam's shrew. Reptiles include western whiptail lizards, leopard lizards, collared lizards, desert horned lizard and the Great Basin spade-foot toad. These species are all either at the northern limit of their range or uncommon in Oregon.

Two guzzlers (wildlife watering devices) are proposed for installation in the Alvord Desert WSA

Table 4. Existing and Potential Livestock Use, Alvord Desert WSA (OR-2-74) and East Alvord WSA (OR-2-73A)

Grazing Allotment	Licensed Aums in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA from Projects (AUMs) [1]	Available but Unallocated Forage in Pastures (AUMs)
Alvord Desert WSA						
Alvord (No. 6012)	8,803	12/01-04/16	30	1,400	750	0
Tule Springs (No. 6018)	1,719	12/01-04/16	5	0	0	0
Barren Valley (No. 0801)	10,237	11/01-03/31	6	6,005	0	6,909
Sand Gap (No. 0802)	1,500	11/01-03/31	70	1,465	0	0
Total Alvord Desert WSA				8,870	750	6,909
East Alvord WSA						
Alvord (No. 6012)	8,803	12/01-04/16	9	593	0	0
Total East Alvord Desert WSA				593	0	0
Total both WSAs				9,463	750	6,909

[1] The increases might or might not result in increased licensed use in the allotment (see narrative).

to enhance wildlife habitat (primarily antelope).

Livestock Grazing

Portions of four grazing allotments are within the Alvord Desert WSA while the East Alvord WSA is entirely within one allotment. Table 4 summarizes existing and potential livestock use in AUMs (animal unit month, the amount of forage required by one cow and calf, or equivalent animals, for one month).

Licensed livestock grazing in pastures wholly or partially in the Alvord Desert WSA is proposed to be increased by 6,909 AUMs by allocating available forage. Increases in the Alvord Desert WSA would vary according to the amount of pasture in the WSA and other factors such as terrain and vegetation.

One livestock project, a four-mile section of the division fence between BLM's Burns and Vale Districts, is proposed within the Alvord Desert WSA. This fence would be located between the Alvord and Sand Gap allotments and the purpose would be to improve management and keep cattle from drifting from the Burns District to the Vale District. The proposed fence would increase licensed use by as much as 750 AUMs in the Alvord allotment.

There are no livestock projects proposed in the East Alvord WSA.

Existing livestock developments (among the man-made features discussed in the Naturalness section) include 2 reservoirs, 5 wells, and 16 miles of fencing in the Alvord Desert WSA and 8 reservoirs and a well and reservoir combination in the East Alvord WSA.

Grazing operators frequently use motor vehicles within and between the two study areas for access to wells and to haul horses. Horses are used to move livestock.

Cultural Resources

The Alvord Desert WSA contains several varied archeologic sites, including some 'early man' sites not often found in the northern Great Basin. These sites are associated with the shores of vast ancient lakes. The people occupying the sites hunted now-extinct Pleistocene big-game animals between 10,000 and 13,000 years ago.

Recreation Use

Existing use of the area for hunting is low. Deer and antelope are found in both WSAs, but their numbers are limited and the animals are scattered. Upland game birds such as chukars and sagegrouse are also found, but better areas to hunt them are available nearby. The limited hunting which does occur is associated with motor vehicles for access.

These two WSAs currently receive off-road vehicle use. The Alvord playa is popular for ORVs such as motorcycles, dune buggies and four-wheel drive vehicles. The sand dunes on the eastern side receive a light use associated with these activities.

The Alvord playa and other alkali lakebeds are popular with land sailers during the summer. Airplane gliders also take off and land on the playas.

Primitive recreation use within the two study areas is low.

Economic Value and Local Income

Livestock grazing, oil and gas and geothermal leasing, and recreation are the only resource outputs which generate economic activity in the two WSAs. As of January 1, 1984, there were 30 oil and gas leases and 9 geothermal leases in the consolidated area.

Economic value and local personal income generated from existing levels of resource outputs of these lands are presented in tables 5a-c. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in

Table 5a. Economic Value and Local Personal Income Generated Annually, Existing Program, Alvord Desert (OR-2-74) and East Alvord Desert (OR-2-73A) WSAs Combined (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	9,463	$71,351	$78,921
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil and Gas leases	Acres	74,900	74,900	22,556
Geothermal leases	Acres	8,340	16,680	5,023
Total			162,931	106,500

Table 5b. Economic Value and Local Personal Income Generated Annually, Existing Program, Alvord Desert WSA (OR-2-74) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	8,870	$66,880	$73,976
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil and Gas leases	Acres	55,510	55,510	16,716
Geothermal leases	Acres	2,520	5,040	1,518
Total			127,430	92,210

Table 5c. Economic Value and Local Personal Income Generated Annually, Existing Program, East Alvord WSA (OR-2-73A) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	593	$4,471	$4,946
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil & Gas leases	Acres	19,390	19,390	5,839
Geothermal leases	Acres	5,820	11,640	3,505
Total			35,501	14,290

the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 111,690 acres from the Alvord Desert WSA and 21,600 acres from the East Alvord WSA to the National Wilderness Preservation System (NWPS). They would be managed as separate wilderness areas.

Wilderness designation under this alternative would preserve a large part of the Alvord Desert, which covers more than 25 square miles and is the dominant feature of these WSAs. It would include the sand dunes on the east side of the playa, which contain a variety of plant and animal life and, the large escarpment to the east of the Alvord Basin, a central feature of the WSAs. In the East Alvord WSA, it would preserve Mickey Hot Springs, a very hot spring, and a gently sloping sagebrush covered plateau.

Wilderness designation would maintain or improve the natural qualities of the two WSAs as well as the outstanding opportunities for solitude and primitive recreation. Closure of 21 miles of ways in the Alvord Desert WSA and 3 miles of ways in the East Alvord WSA would improve the naturalness of the area by eliminating most vehicle use, and allowing the ways to revegetate and become less noticeable. Restrictions on vehicle use would also prevent new ways from occurring as a result of cross-county travel.

Some of the ways may continue to be used as necessary for maintaining existing livestock facilities, on a limited basis. Closing the ways would also improve opportunities for solitude and improve the quality of primitive recreation by reducing motor vehicle disturbance. With the continued use of dead-end and boundary roads, such disturbance would not be eliminated.

Designation of the two WSAs under the all wilderness alternative would also protect the outstanding special features in their present condition. For both WSAs, this would include geologic values such as the Alvord Desert and Mickey Hot Springs, wildlife values, including those associated with the ACEC and outstanding scenic quality.

Possible surface disturbing activities such as mineral or energy development would also be nearly eliminated. However, energy development on approximately 3,860 acres of geothermal leases in the two WSAs could occur because the leases contain no wilderness protection stipulations. BLM would have difficulty managing areas with such development to maintain a natural appearance. Opportunities for solitude and the quality of primitive recreation activities could also be adversely affected.

Within the remainder of the study areas no new surface disturbance from energy or mineral development would be permitted. This would have the beneficial effect of maintaining the area's natural appearance, as well as maintaining opportunities for primitive recreation and solitude.

The botanical, wildlife and scenic values would be maintained. This includes plant species of special interest as well as the vegetative communities found in the ACEC and RNA. A wide variety of wildlife associated with the northern Great Basin would be protected.

A portion of the Alvord Desert study area would not be manageable as wilderness under the all wilderness alternative because it would not be possible to restrict vehicle use. The playa is a traditional vehicle play area with several access points, some of which are from private land. Because there are no physical barriers to this area, it would be very difficult to prevent this traditional use from occurring.

The **enhanced wilderness alternative** would combine a portion of the Alvord Desert WSA (93,620 acres) with the entire East Alvord WSA (21,600 acres) into a single wilderness area and would add 121,520 acres to the NWPS, assuming acquisition of 6,250 acres of split-estate land and 50 acres of private land. The effects of this alternative for the area recommended as suitable for wilderness are similar to those of the all wilderness alternative. It would protect and maintain most existing wilderness characteristics and special features, including those associated with the ACEC and RNA; it would not include the Alvord Desert playa and the snowy plover habitat.

Closure of the boundary road separating the two WSAs (12 miles) and the six dead-end roads (9 miles) in the Alvord Desert WSA, and 24 miles of ways (21 in the Alvord Desert WSA and 3 in the East Alvord WSA) would enhance naturalness by restricting off-road vehicle use and the resulting surface disturbance. The closed roads and ways would be allowed to revegetate making them less noticeable and enhancing naturalness. The road and way closures would also enhance the quality of solitude and primitive recreation activities by preventing vehicle intrusions. This would improve manageability of the area as wilderness.

Acquisitions of private and split-estate land would preclude the possible development of these areas and the need for access to them, maintaining the naturalness of the area. (The split-estate parcels in the western part of the WSA are within the Alvord KGRA and have a high geothermal potential.) Naturalness, opportunities for solitude, and the quality of primitive recreation could be adversely affected by any development on the leases which do not have wilderness protection stipulations within the area recommended as suitable.

Wilderness values in the 18,070 acres recommended nonsuitable (all in the Alvord Desert WSA) under the enhanced wilderness alternative, including those associated with the special features which occur within this part of the study area, would be subject to disturbance from other resource uses. This acreage is entirely on the western side and includes all of the Alvord Desert playa.

Motor vehicles used by recreationists on the Alvord Desert playa would detract from opportunities for solitude and primitive recreation on the playa. Off-road vehicles on the playa could be seen and heard from the sand dunes east of the playa and within the area recommended as suitable for wilderness, and this would reduce opportunities for solitude and primitive recreation in that portion of the wilderness.

Surface disturbing activities such as mineral or energy development could adversely effect the naturalness of the area recommended as nonsuitable for wilderness. Opportunities for solitude and primitive recreation would be affected by vehicle use on the playa, or on any new access routes, and by any other activity resulting from energy development.

The special features of the western side of the WSA would be subject to disturbance from development. In the area recommended as nonsuitable, that includes the outstanding scenic values associated with the Alvord Desert playa.

The **preferred alternative** would combine portions of both WSAs (64,410 acres of the Alvord Desert WSA and 15,145 acres of the East Alvord WSA) into a single wilderness area and add 84,630 acres to the NWPS, assuming acquisition of 50,075 acres of split-estate land. Closure of 9 miles of the boundary road separating the two WSAs, 2 dead-end roads (totaling 3 miles) in the Alvord Desert WSA, and 8 miles of ways (5.5 miles in the Alvord Desert WSA and 2.5 in the East Alvord WSA) in the area recommended suitable would allow them to revegetate and become less noticeable.

Acquisition of split-estate inholdings and boundary parcels would enhance the manageability of the area by precluding potential development of these inholdings and adverse effects to the area's wilderness values.

As with the all and enhanced wilderness alternatives, the wilderness values and special features in the area recommended as suitable for wilderness would be preserved in their present condition. The natural condition of the area and the outstanding opportunities for solitude and primitive recreation would be preserved.

The wilderness under this alternative would include most of the two study areas' special features, including some of the outstanding scenery, plant species of special interest, cultural resources, geologic features and wild horses. The wildlife and plant values associated with the ACEC would also be protected.

Wilderness values and special features identified within the areas recommended nonsuitable (53,735 acres, including 47,280 acres in the Alvord Desert WSA and 6,455 acres in the East Alvord WSA) would be subject to disturbance from other resource uses. This acreage includes the Alvord Desert playa and the snowy plover habitat, also excluded under the enhanced alternative, as well as the northeastern and southwestern portions of the Alvord Desert WSA and the northwestern portion of the East Alvord WSA including Mickey Hot Springs.

Potential energy and mineral development could adversely affect wilderness values in the areas recommended as nonsuitable. (The entire area has been identified as having a moderate potential for oil and gas and the western portion has a high potential for geothermal resources.)

Scenic values, including some of the area with outstanding scenery, could be adversely affected by any development on the western side of the WSAs which are recommended as nonsuitable. Any development in this area would be easily visible from the ridge within the WSAs. Due to the ease of viewing this area from within the wilderness area, developments here could also adversely affect the scenic quality of the area recommended as suitable for wilderness.

Within the areas recommended nonsuitable, opportunities for solitude would be adversely affected by any new developments. This would be especially true in areas where new energy development could result in increased human activity and the need for increased access to development sites. This could also affect the opportunities for solitude at the edges of the area recommended suitable as wilderness.

Adverse effects on primitive recreation could occur as a result of increased disturbance from potential energy development. Energy development in the Alvord Desert area or around Mickey Hot Springs would have an adverse effect on the quality of primitive recreation in these attractive areas. Increased access as a result of development activities would also affect opportunities for primitive recreation at the edges of the areas recommended as suitable for wilderness.

The special features which occur outside the areas recommended for wilderness under this alternative would be subjected to disturbance from other activities or resource uses. Primarily affected would be the scenic quality of the western portion, the botanical values associated with Mickey Basin RNA, and the geological values associated with Mickey Hot Springs.

Under the **no wilderness/no action alternative**, wilderness values and special features of both WSAs would be subject to disturbance from developments, including the possible development of energy or mineral resources. Effects on specific wilderness values would be similar to those for the nonsuitable portions under the preferred alternative.

However, under this alternative all of both study areas would be open to potential energy development (all of both areas have a moderate potential for occurrence of oil and gas in addition to the moderate to high geothermal potential on the western side). Naturalness, opportunities for solitude and the quality of primitive recreation throughout both WSAs could be adversely affected by such disturbances. Some of the area's important special features such as geologic features, wildlife values, and scenery, could be affected. Although the RNA and ACEC would remain in effect and would emphasize the protection of some plant and animal species and communities, they could still be subject to disturbing activities because the area would not be withdrawn from mineral exploration and development.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development, including development of up to 160 megawatts power generation from geothermal steam. Table 6 shows the total acres which would be withdrawn under each alternative, including acreages with high or moderate mineral or energy potential.

Table 6. Effects of Alternatives on Energy and Mineral Development, Alvord Desert (OR-2-74) and East Alvord (OR-2-73A) WSAs

	Acres Withdrawn				
	All Wilderness		Enhanced Wilderness (All of One and Portion Other WSA Combined)	Preferred Alternative (Portions of Both WSAs Combined)	No Wilderness/No Action (Both WSAs)
	Alvord Desert	East Alvord			
Total area	111,690	21,600	115,220[1]	79,555[2]	0
Geothermal rated high	32,730[3]	9,270	24,080	13,930	0
Geothermal rated moderate	56,055	12,330	68,385	65,325	0
Oil and Gas rated moderate	111,690	21,600	115,220	79,555	0
Diatomite rated moderate	26,940	920	27,860	25,450	0

[1] Development also precluded on an additional 6,750 acres if split-estate and private land is acquired, as proposed under this alternative.
[2] Development also precluded on an additional 5,075 acres if split-estate land is acquired, as proposed under this alternative.
[3] 14,810 acres of this total are not associated with the Alvord Desert playa.

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness.

Under the **all and enhanced wilderness alternatives**, two proposed wildlife guzzlers might or might not be allowed in wilderness depending on a site-specific assessment of whether they conform with Wilderness Management Policy. If they were not allowed, the opportunity to improve wildlife habitat (primarily antelope) by providing additional sources of water would be foregone.

These guzzlers would be constructed under the **preferred and no wilderness/no action alternatives** (they would be in the area recommended nonsuitable under the preferred alternative). The guzzlers could increase wildlife populations.

Effects on Livestock Grazing

Wilderness designation would not affect livestock use in any of the four allotments associated with the WSA.

Since increases in licensed use through allocation of available forage might not be allowed under Wilderness Management Policy, all increases in pastures partially in areas recommended suitable might be foregone. Thus, increases foregone within these pastures of the Alvord Desert WSA would range from 0 to 6,909 AUMs under the **all wilderness, enhanced wilderness and preferred alternatives**.

Under the all wilderness, enhanced wilderness and preferred alternatives, the proposed construction of four miles of fence in the Alvord Desert WSA might or might not be allowed, depending on a site-specific assessment of whether it would conform with Wilderness Management Policy. If the fence could not be built, the opportunity to increase licensed use by as much as 750 AUMs over 10 years through improved management would be foregone.

The proposed fence has a benefit/cost ratio greater than 1:1.

Under the **no wilderness/no action alternative**, the proposed fence would be built, making a potential 750 additional AUMs available for livestock use and creating a better grazing management system in the Alvord, Sand Gap and Barren Valley allotments. The additional AUMs (up to 750) may be licensed in the Alvord allotment if it is sustainable and all forage needs in the allotment have been considered.

Under the all wilderness alternative, the East Alvord and Alvord Desert WSAs would not be combined, leaving the boundary road and dead-end roads open, so access for the grazing operator would not be affected.

Access would be more difficult under the enhanced wilderness and preferred alternatives since the road dividing the two WSAs would be closed. Grazing operators would be inconvenienced if use of vehicles were restricted, because they frequently use the road to supervise livestock grazing and for access to wells which need to be reset manually when the water troughs are filled. However, use of vehicles would be allowed if it were determined that there were no practical alternative to such use.

There would be no restrictions on access for livestock operators under the no wilderness/no action alternative.

Effects on Recreation Use

The quality of and opportunities for primitive recreation in the Alvord Desert and East Alvord WSAs would be maintained or improved under the **all wilderness alternative**. Eliminating vehicle use on ways throughout the two WSAs would improve the quality of primitive recreation.

This alternative would reduce vehicle-oriented recreation, which would primarily affect recreation use on the Alvord Desert playa. Because current recreation use in other parts of the WSAs is very low, closing the vehicle ways would not have much effect on recreation use. Some of the reduction in use from loss of vehicle-oriented recreation on the playa could be offset by an increase in primitive recreation use after wilderness designation. However, because of vehicle restrictions in the all wilderness alternative, overall recreational use of the WSAs probably would decline.

Under the **enhanced wilderness alternative**, closing approximately 12 miles of the boundary road between the two WSAs and six dead-end roads would increase the opportunities for high quality primitive recreation.

The primary location of vehicle-oriented recreation, the Alvord Desert playa, is recommended as nonsuitable under this alternative and would not be affected by wilderness designation. Due to the low level of use occurring throughout the rest of the area, vehicle-oriented recreation would not be affected by road and way closures. Quality of primitive recreation could be reduced in the portions recommended nonsuitable for wilderness. Overall recreation use of the area would not be affected under the enhanced wilderness alternative.

Under the **preferred alternative**, opportunities for primitive recreation would be maintained or improved in the areas recommended suitable for wilderness. This alternative also combines the two WSAs but the acreage is reduced. The effects of this alternative are similar to those of the enhanced wilderness alternative. Quality of primitive recreation could be reduced in the nonsuitable portion. Overall recreation use would remain about the same.

Under the **no wilderness/no action alternative**, primitive recreation would be subject to continued disturbances by existing vehicle access routes and use (although vehicle use in the area for recreation or other purposes is not substantial). No effect on overall recreation use is expected.

The proposed guzzlers and resulting small increase in wildlife numbers would cause only a slight increase in recreation use. This opportunity might be foregone under the all and enhanced wilderness alternatives, but would be realized under the partial and no wilderness/no action alternatives. In either case, the change would not significantly affect overall recreation use.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 7a-c and 8a-c the consolidated area and for each individual WSA. Tables 7a-c show the effects on economic value and tables 8a-c, the effects on local personal income. It is not known at this time whether individual proposed structural developments, such as the fence and guzzlers proposed for this WSA, would be constructed if the area were designated wilderness; nor is it known if the grazing increases would be allowed.

The columns for the wilderness alternatives show the effects as a range of values dependent upon whether structural improvements, grazing operator access, and/or grazing adjustments were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The all wilderness alternative would not restrict vehicle use. Use would be restricted, however, under the enhanced wilderness and preferred alternatives. The maximum impact from road closures upon the grazing operator in the Alvord Desert WSA would be an increase in cost of about $68 per year. There would be no increase in cost in the East Alvord WSA.

Table 7a. Effects of Alternatives on Annual Economic Value, Alvord Desert (OR 2-74) and East Alvord (OR-2-73A) WSAs Combined (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Grazing:					
Adjustments [1]	AUM	0 to +6,909	0 to +6,909	0 to +6,909	+6,909
Investment [2]	AUM	0 to +750	0 to +750	0 to +750	+750
Big game hunting [3]	RVD	0 to +6	0 to +6	0 to +6	+6
Upland game hunting [3]	RVD	0 to +8	0 to +8	0 to +8	+8
Oil and Gas Leases	Acres	-74,900	-56,830	-38,345	0
Geothermal Leases	Acres	-8,340	-6,300	0	0
VALUE OF PLANNED INVESTMENTS [4]					
Grazing	$	0 to +5,655	0 to +5,655	0 to +5,655	+5,655
Big game hunting	$	0 to +136	0 to +136	0 to +136	+136
Upland game hunting	$	0 to +251	0 to +251	0 to +251	+251
Total [5]	$	0 to +6,042	0 to +6,042	0 to +6,042	+6,042
Investments [6]	$	0 to -1,138	0 to -1,138	0 to -1,138	-1,138
Net Economic Value	$	0 to +4,904	0 to +4,904	0 to +4,904	+4,904
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS					
Grazing:					
Adjustments	$	0 to +52,094	0 to +52,094	0 to +52,094	+52,094
Reduced access [7]	$	0	-68	-68	0
Oil and Gas Leases	$	-74,900	-56,830	-38,345	0
Geothermal Leases	$	-16,680	-12,600	0	0
Total	$	-91,580 to -39,486	-69,498 to -17,404	-38,413 to +13,681	+52,094
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS					
All categories	$	-91,580 to -34,582	-69,498 to -12,500	-38,413 to +18,585	+56,998

[1] Adjustments to use currently available but unallocated livestock forage.

[2] Expected future increases due to range improvement investments.

[3] Expected future increases from proposed wildlife projects.

[4] Expenditures for structural projects involving up to $13,400, including construction and maintenance plus any added annual cost.

[5] Detail may not sum to "Total" due to rounding.

[6] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[7] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 7b. Effects of Alternatives on Annual Economic Value, Alvord Desert WSA (OR-2-74) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Grazing:					
Adjustments [1]	AUM	0 to +6,909	0 to +6,909	0 to +6,909	+6,909
Investment [2]	AUM	0 to +750	0 to +750	0 to +750	+750
Big game hunting [3]	RVD	0 to +6	0 to +6	0 to +6	+6
Upland game hunting [3]	RVD	0 to +8	0 to +8	0 to +8	+8
Oil and Gas Leases	Acres	-55,510	-37,440	-25,410	0
Geothermal Leases	Acres	-2,520	-480	0	0
VALUE OF PLANNED INVESTMENTS [4]					
Grazing	$	0 to +5,655	0 to +5,655	0 to +5,655	+5,655
Big game hunting	$	0 to +136	0 to +136	0 to +136	+136
Upland game hunting	$	0 to +251	0 to +251	0 to +251	+251
Total [5]	$	0 to +6,042	0 to +6,042	0 to +6,042	+6,042
Investments [6]	$	0 to -1,138	0 to -1,138	0 to -1,138	-1,138
Net Economic Value	$	0 to +4,904	0 to +4,904	0 to +4,904	+4,904
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS					
Grazing:					
Adjustments	$	0 to +52,094	0 to +52,094	0 to +52,094	+52,094
Reduced access [7]	$	0	-68	-68	0
Oil and Gas Leases	$	-55,510	-37,440	-25,410	0
Geothermal Leases	$	-5,040	-960	0	0
Total	$	-60,550 to -8,456	-38,468 to +13,626	-25,478 to +26,616	+52,094
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS					
All categories	$	-60,550 to -3,552	-38,468 to +18,530	-25,478 to +31,520	+56,998

[1] Adjustments to use currently available but unallocated livestock forage.
[2] Expected future increases due to range improvement investments.
[3] Expected future increases from proposed wildlife projects.
[4] Expenditures for structural projects involving up to $13,400, including construction and maintenance plus any added annual cost.
[5] Detail may not sum to "Total" due to rounding.
[6] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.
[7] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 7c. Effects of Alternatives on Annual Economic Value, East Alvord WSA (OR-2-73A) (1981 price levels)

Item	Unit of Measure	Enhanced Wilderness	All Wilderness, Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Oil and Gas Leases	Acres	-19,390	-12,935	0
Geothermal Leases	Acres	-5,820	0	0
VALUE OF EXPECTED CHANGES IN OUTPUTS				
Oil and Gas Leases	Acres	-19,390	-12,935	0
Geothermal Leases	Acres	-11,640	0	0
Total	$	-31,030	-12,935	0

Table 8a. Effects of Alternatives on Local Personal Income, Alvord Desert (OR-2-74) and East Alvord (OR-2-73A) WSAs Combined (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Grazing:					
Adjustments [1]	AUM	0 to +6,909	0 to +6,909	0 to +6,909	+6,909
Investment [2]	AUM	0 to +750	0 to +750	0 to +750	+750
Big game hunting [3]	RVD	0 to +6	0 to +6	0 to +6	+6
Upland game hunting [3]	RVD	0 to +8	0 to +8	0 to +8	+8
Oil and Gas Leases	Acres	-74,900	-56,830	-38,345	0
Geothermal Leases	Acres	-8,340	-6,300	0	0
INCOME FROM PROPOSED INVESTMENTS [4]					
Grazing	$	0 to +6,255	0 to +6,255	0 to +6,255	+6,255
Big game hunting	$	0 to +51	0 to +51	0 to +51	+51
Upland game hunting	$	0 to +106	0 to +106	0 to +106	+106
Construction Activity [5]	$	0 to +1,800	0 to +1,800	0 to +1,800	+1,800
Total [6]	$	0 to +6,412	0 to +6,412	0 to +6,412	+6,412
INCOME FROM OTHER EXPECTED OUTPUT CHANGES					
Grazing:					
Adjustments	$	0 to +57,828	0 to +57,828	0 to +57,828	+57,828
Oil and Gas Leases	$	-22,256	-17,114	-11,548	0
Geothermal Leases	$	-5,023	-1,897	0	0
Total	$	-27,279 to +30,549	-19,011 to +38,817	-11,548 to +46,280	+57,828
INCOME FROM ALL OUTPUT CHANGES					
All categories [6]	$	-27,279 to +36,961	-19,011 to +45,229	-11,548 to +52,692	+64,240

[1] Adjustments to utilize currently available but unallocated livestock forage.

[2] Expected future increases due to range improvement investments.

[3] Expected future increases from proposed wildlife projects.

[4] Expenditures for structural projects involving up to $13,400, including construction and maintenance plus any added annual cost.

[5] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[6] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 5.

Table 8b. Effects of Alternatives on Local Personal Income, Alvord Desert WSA (OR-2-74) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Grazing:					
Adjustments [1]	AUM	0 to +6,909	0 to +6,909	0 to +6,909	+6,909
Investment [2]	AUM	0 to +750	0 to +750	0 to +750	+750
Big game hunting [3]	RVD	0 to +6	0 to +6	0 to +6	+6
Upland game hunting [3]	RVD	0 to +8	0 to +8	0 to +8	+8
Oil and Gas Leases	Acres	-55,510	-37,440	-25,410	0
Geothermal Leases	Acres	-2,520	-480	0	0
INCOME FROM PROPOSED INVESTMENTS [4]					
Grazing	$	0 to +6,255	0 to +6,255	0 to +6,255	+6,255
Big game hunting	$	0 to +51	0 to +51	0 to +51	+51
Upland game hunting	$	0 to +106	0 to +106	0 to +106	+106
Construction Activity [5]	$	0 to +1,800	0 to +1,800	0 to +1,800	+1,800
Total [6]	$	0 to +6,412	0 to +6,412	0 to +6,412	+6,412
INCOME FROM OTHER EXPECTED OUTPUT CHANGES					
Grazing:					
Adjustments	$	0 to +57,828	0 to +57,828	0 to +57,828	+57,828
Oil and Gas Leases	$	-16,716	-11,275	-7,652	0
Geothermal Leases	$	-1,518	-144	0	0
Total	$	-18,234 to +39,594	-11,419 to +46,409	-7,652 to +50,176	+57,828
INCOME FROM ALL OUTPUT CHANGES					
All categories [6]	$	-18,234 to +46,006	-11,419 to +52,821	-7,652 to +56,588	+64,240

[1] Adjustments to utilize currently available but unallocated livestock forage.

[2] Expected future increases due to range improvement investments.

[3] Expected future increases from proposed wildlife projects.

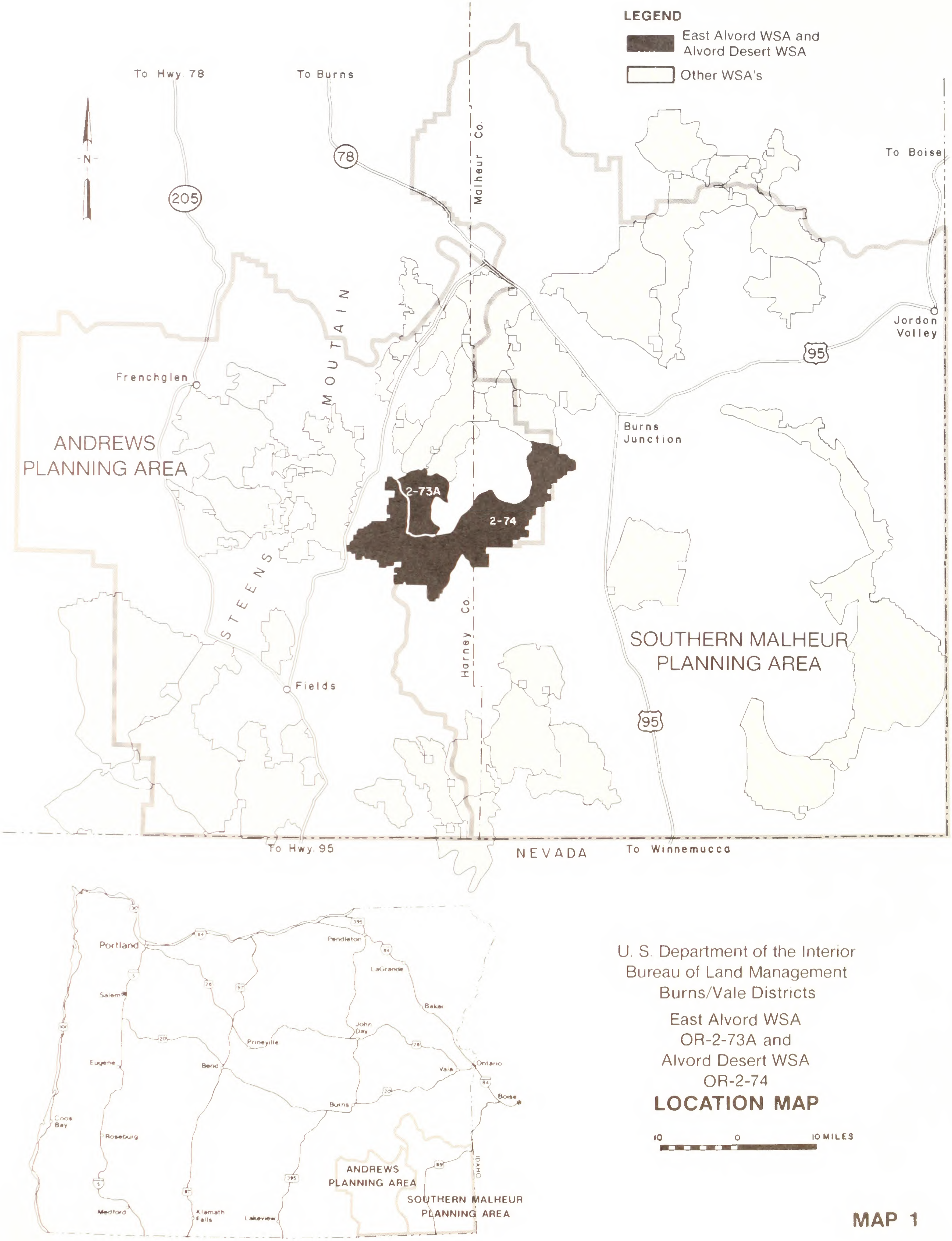
[4] Expenditures for structural projects involving up to $13,400, including construction and maintenance plus any added annual cost.

[5] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[6] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 5.

Table 8c. Effects of Alternatives on Local Personal Income, East Alvord WSA (OR-2-73A) (1981 price levels)

Item	Unit of Measure	Enhanced Wilderness	All Wilderness, Preferred	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Oil and Gas Leases	Acres	-19,390	-12,935	0
Geothermal Leases	Acres	-5,820	0	0
INCOME FROM OTHER EXPECTED OUTPUT CHANGES				
Oil and Gas Leases	$	-5,839	-3,895	0
Geothermal	$	-3,505	0	0
Total		-9,344	-3,895	0



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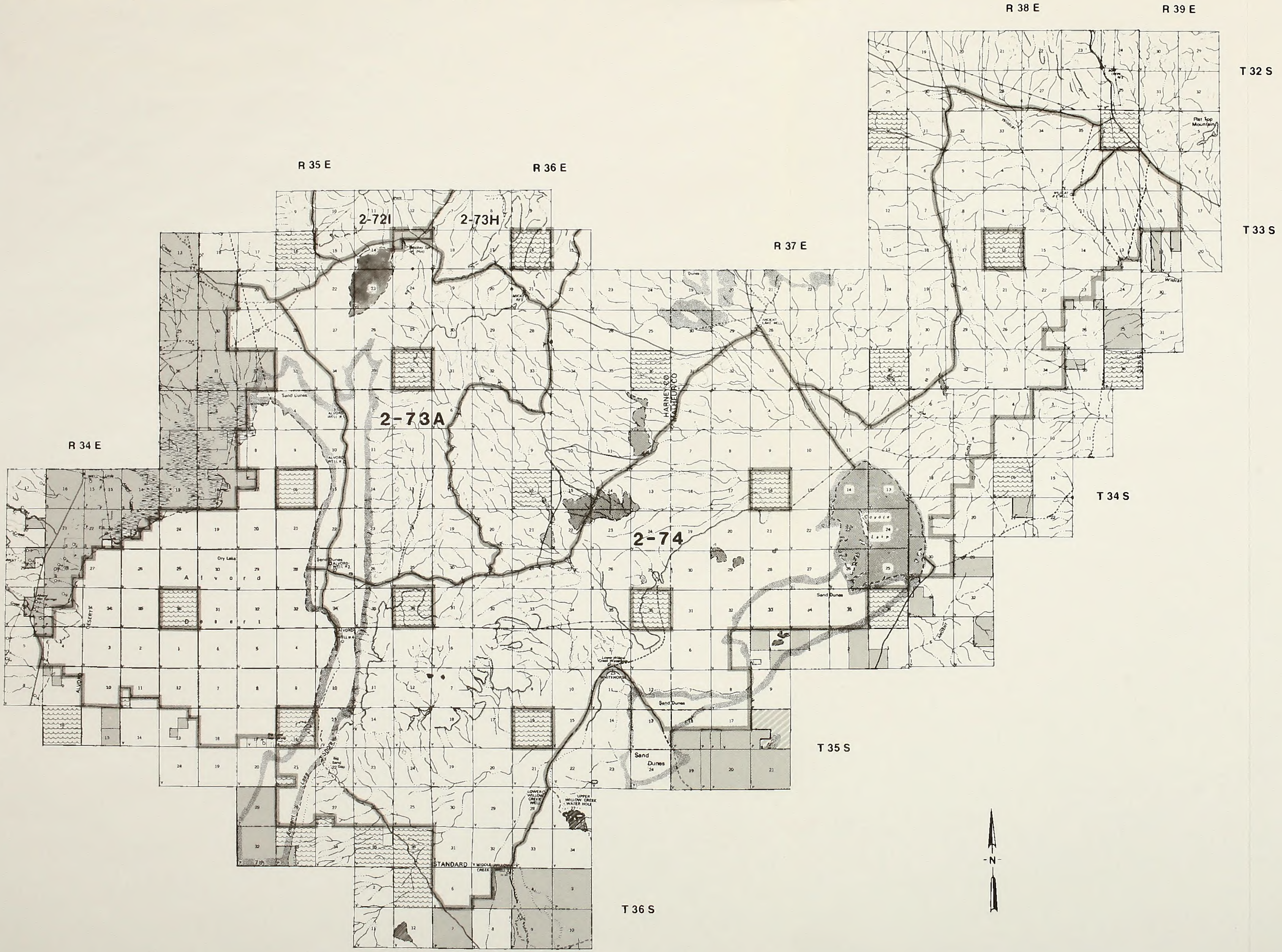
Bureau of Land Management
Burns/Vale Districts

East Alvord WSA
OR-2-73A and
Alvord Desert WSA
OR-2-74

LOCATION MAP

MAP 1



LEGEND

- ▬ Wilderness Study Area Boundary
- ▬ ▬ Boundary of Adjacent Wilderness Study
- ☐ Bureau of Land Management
- ▨ State
- ▩ Private
- ▤ BLM Surface-State or Private Subsurface (Split Estate)

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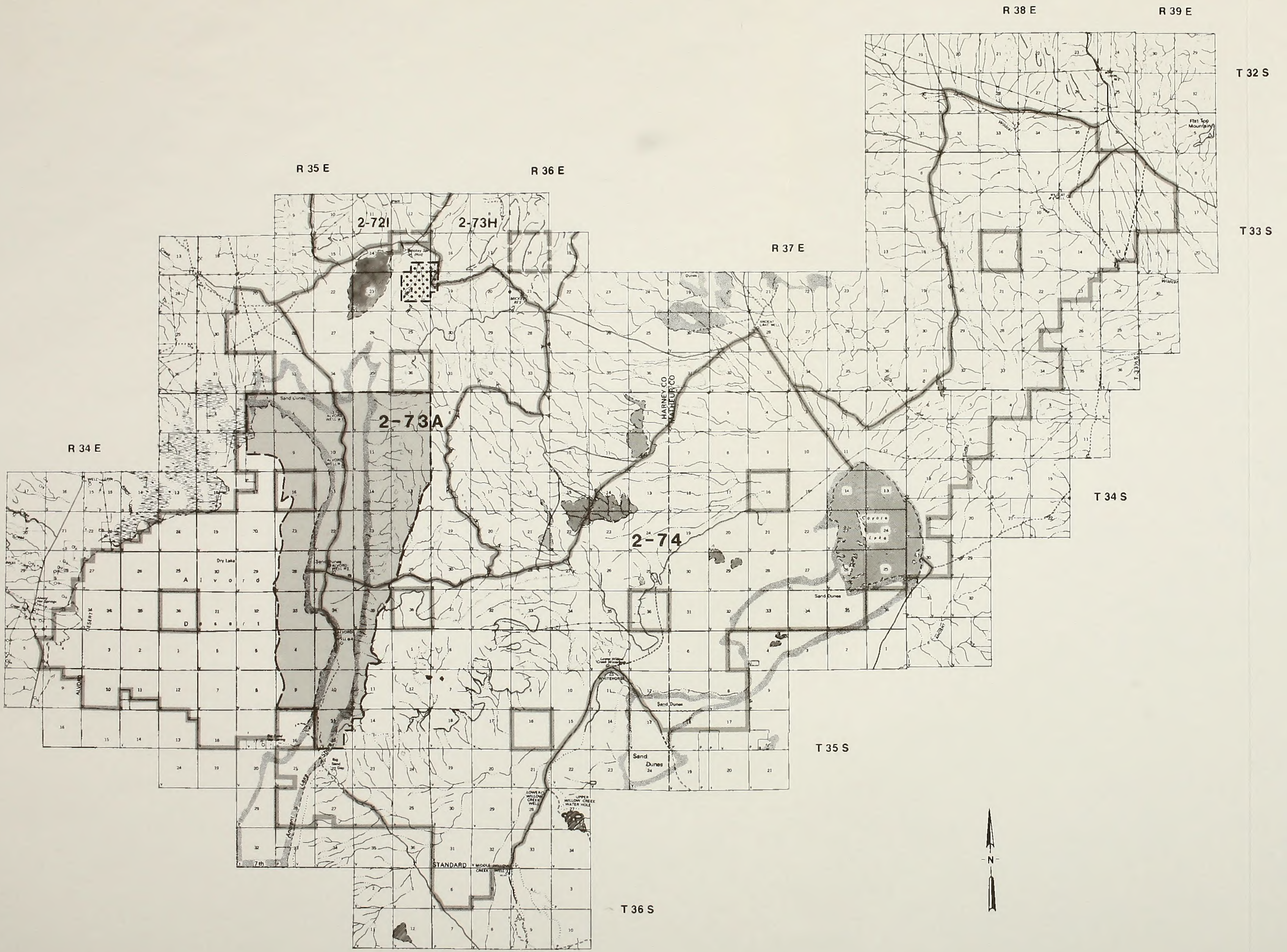
East Alvord WSA
OR-2-73A and
Alvord Desert WSA
OR-2-74

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

▬ Wilderness Study Area Boundary

╍ Boundary of Adjacent Wilderness Study

▨ Alvord Desert ACEC

⁘ Mickey Basin RNA

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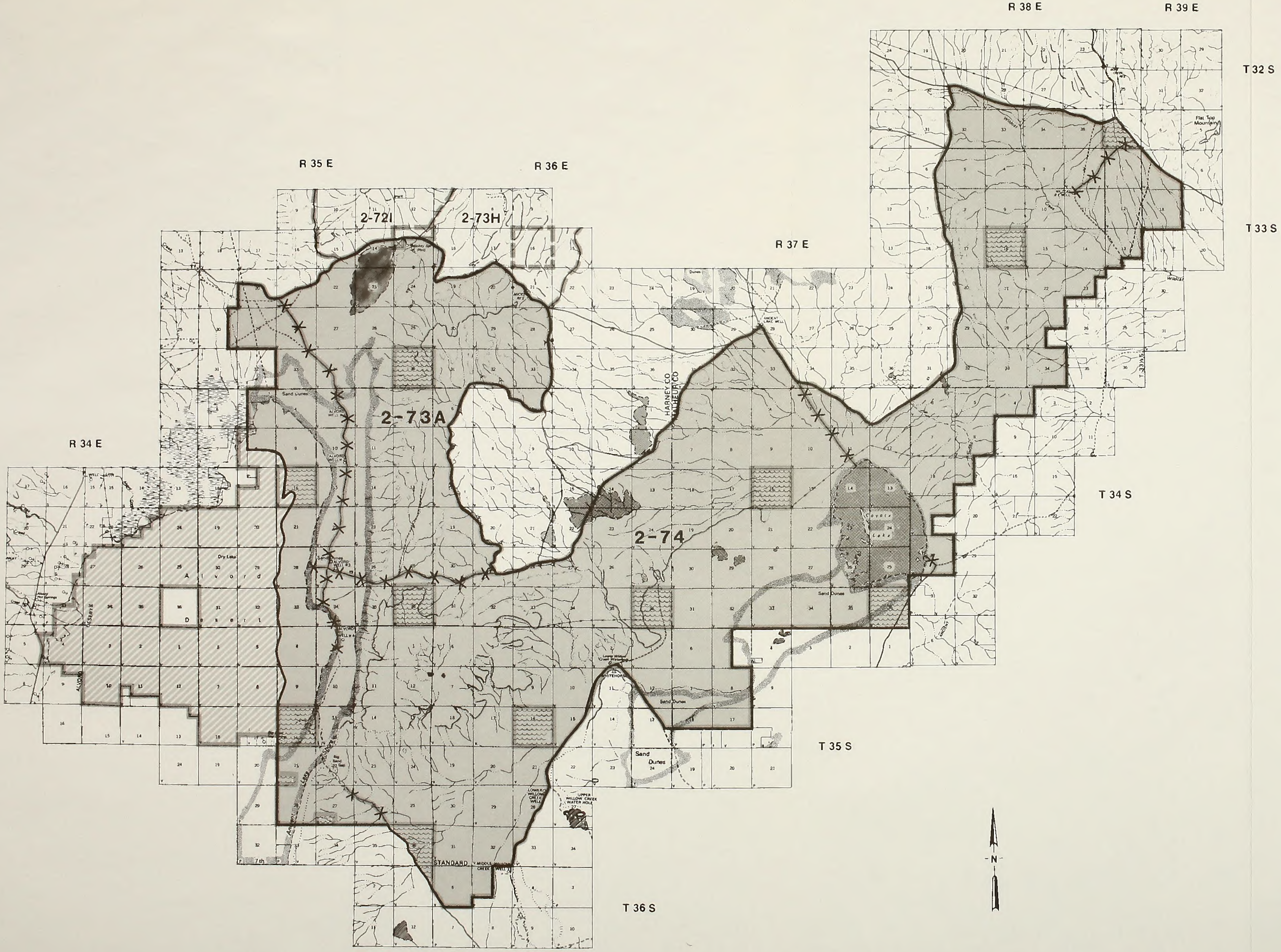
East Alvord WSA
OR-2-73A and
Alvord Desert WSA
OR-2-74

AREA OF CRITICAL ENVIRONMENTAL CONCERN & RESEARCH NATURAL AREA

1 0 1 2 MILES

MAP 3



LEGEND

- ▬ Wilderness Study Area Boundary
- ▬ ▬ Boundary of Adjacent Wilderness Study
- ☐ Recommended Suitable for Wilderness
- ▨ Recommended Non-suitable for Wilderness
- ▩ Non-Federal Land within Recommended Wilderness
- ▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness
- ✕—✕ Recommended Road Closure

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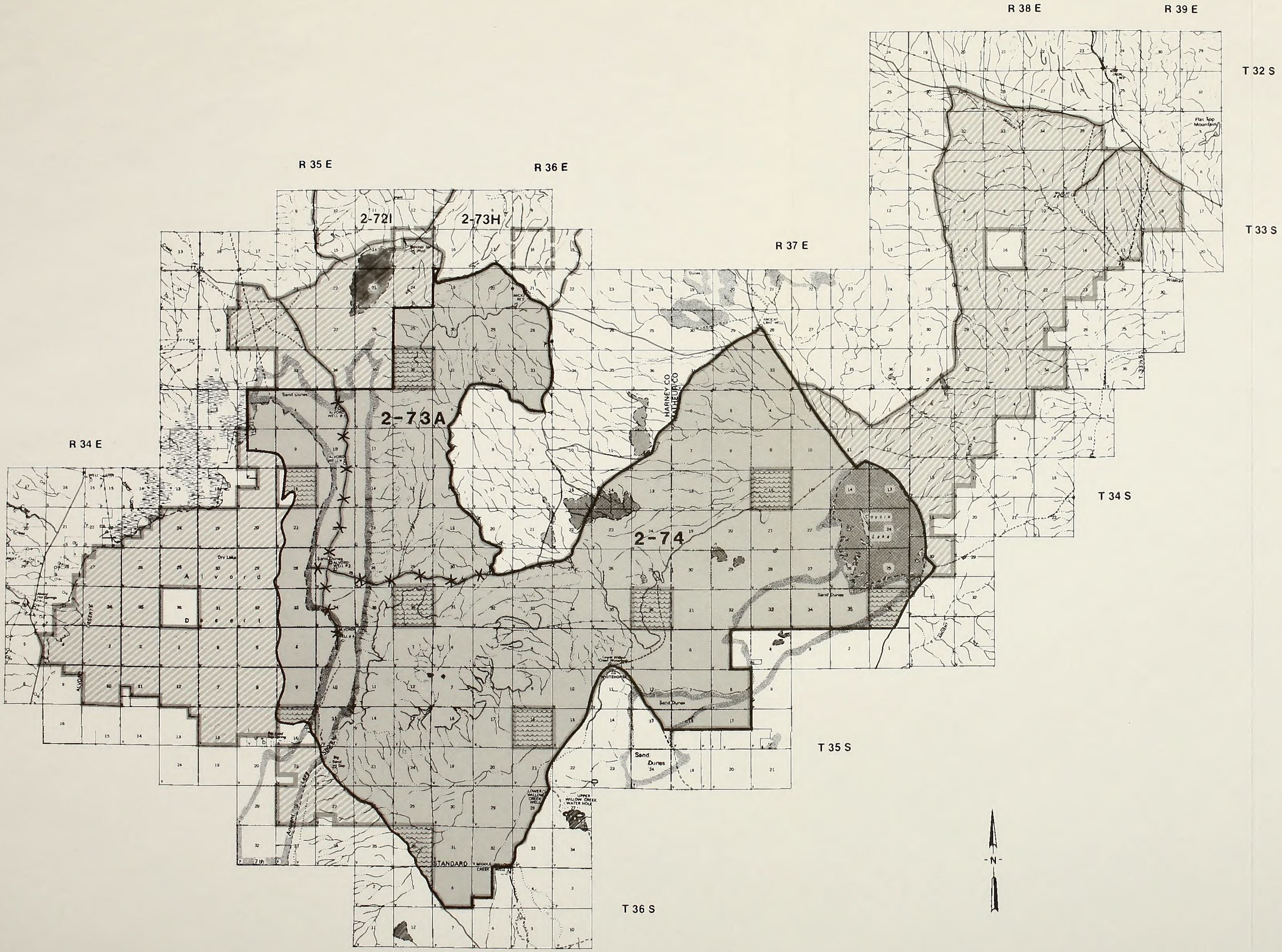
East Alvord WSA
OR-2-73A and
Alvord Desert WSA
OR-2-74

ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 4



LEGEND

- ▬ Wilderness Study Area Boundary
- ▬ ▬ Boundary of Adjacent Wilderness Study
- ▢ Recommended Suitable for Wilderness
- ▨ Recommended Non-suitable for Wilderness
- ≋ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness
- ✕—✕ Recommended Road Closure

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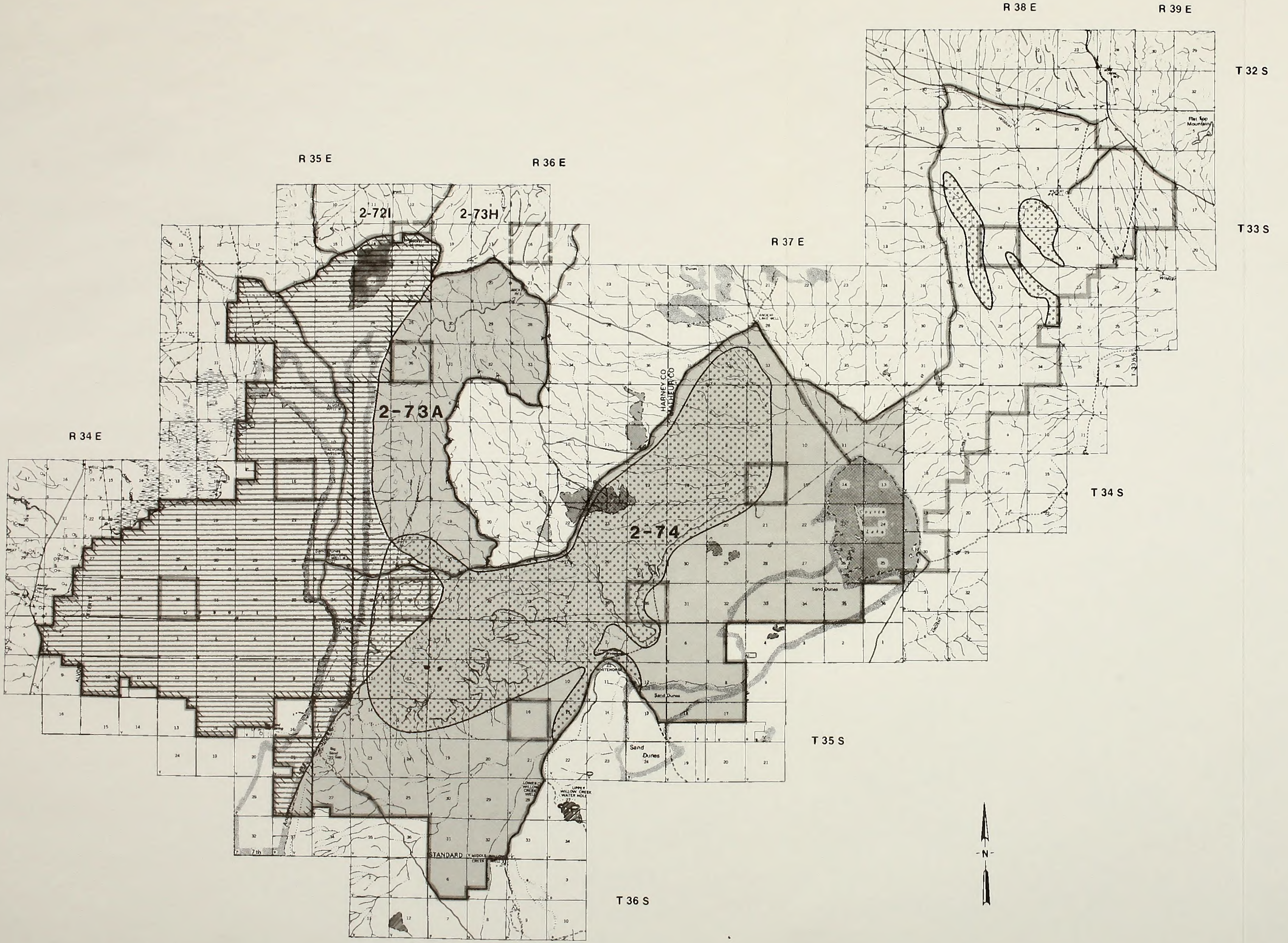
East Alvord WSA
OR-2-73A and
Alvord Desert WSA
OR-2-74

PREFERRED ALTERNATIVE

1 0 1 2 MILES

MAP 5



- ░ **Medium Potential (3B) for Diatomite**
- ▤ **High Potential (4D) for Geothermal Resources**
- ▒ **Medium Potential (3B) for Geothermal Resources**
- ▨ **Portion of WSA within known Geothermal Resource Area**

Entire WSA:
Medium Potential
(3B) for Oil and Gas

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East Alvord WSA
OR-2-73A and
Alvord Desert WSA
OR-2-74

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 6

East Alvord WSA, OR-2-73A. The northern boundary area looking southeast at the ridgeline which runs through the central portion of the WSA. The foreground shows part of a basin in the northern portion of the area. The entire area is recommended suitable under the enhanced alternative. The ridgeline is within the area recommended suitable while the basin is recommended nonsuitable under the partial (preferred) alternative. April 1984.

East Alvord WSA, OR-2-73A. The central portion of the study area looking northwest. Within the area recommended suitable under the enhanced alternative. Under the preferred alternative, the rolling hills are within the area recommended suitable and the remainder is nonsuitable. Shows the rounded rolling hills typical of this part of the WSA and the Steens Mountain ridgeline in the background. September 1983.

East Alvord WSA, OR-2-73A. Mickey Hot Springs in the northern portion of the study area looking south. The hot springs area is recommended suitable under the enhanced alternative and nonsuitable under the preferred alternative. This shows one of several pools and stream vents of the hot springs (left foreground) and the main ridgeline in the WSA (background left). April 1984.

Alvord Desert WSA, OR-2-74. East of the Alvord Desert Playa looking west. The greasewood hummock portion of the Alvord Desert WSA is included in the area recommended suitable under the enhanced and preferred alternatives. Greasewood hummocks as seen in this view are dominant in this portion of the study area. As with most of the study area the primary view to the west is of Steens Mountain (the High Steens WSA, OR-2-85F). This shows the strong visual relationship between the two study areas. April 1984.

Alvord Desert WSA, OR-2-74. Along the ridgeline in the north central portion of the WSA looking southeast. This portion of the WSA is recommended suitable under the enhanced and preferred alternatives. A steep west-facing escarpment rises above the eastern side of the Alvord Basin and is the highest point in the study area. April 1984.

Alvord Desert WSA, OR-2-74. The northwest portion of the Coyote Lake lakebed looking south. The Trout Creek Mountains are on the horizon. Coyote Lake is recommended suitable under the enhanced and preferred alternative. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Mahogany Ridge Wilderness Study Area (OR-2-77)

General Description of the Study Area

The Mahogany Ridge wilderness study area (WSA) is located 102 miles southeast of Burns (12 miles southeast of Fields) in Harney County (see map 1). The Whitehorse Ranch county road, which runs between the Fields-Denio county road and U.S. Highway 95, lies 1/2 mile to the north of the WSA. Nevada State Highway 140 is 27 miles to the southwest.

The Mahogany Ridge study area is somewhat rectangularly shaped, containing 27,210 acres of public land (see map 2). Within the study area are 22 private and split-estate (federally managed surface, state or privately owned subsurface mineral rights) inholdings totaling 1,920 acres. Nineteen of these parcels (1,520 acres) are privately owned while the remaining parcels (400 acres) are split-estate lands. Almost all of the private inholdings are located in the bottoms of the major drainages which run through the center of the WSA, or near other water sources.

The WSA is about 12 miles long and averages 4 miles in width, although it narrows to 2 miles in the center. The boundaries of the area are formed by a combination of BLM roads, private land, and split-estate land. With the exception of one parcel of split-estate land in the central portion, all of the WSA's eastern boundary is formed by a BLM road. All of the other boundaries abut private land.

On the north, a "finger" of private land enters the WSA for 2 miles along Trout Creek. Six dead-end roads totaling about 13.5 miles also penetrate the WSA forming part of the boundary. In the northeast, one of these roads leads to an 80-acre parcel of private land. This parcel is also technically part of the boundary even though it is essentially surrounded by public land.

The Mahogany Ridge study area lies within the Trout Creek Mountain Range in southeastern Oregon. It is in the western edge of the mountains near the Nevada border. This part of the Trout Creeks is characterized by a large flat-topped plateau which gradually slopes to the north and west. The plateau is deeply gouged by three drainages which flow to the north and northwest. These three drainages and the large ridges which separate them are the major physical features of the Mahogany Ridge WSA.

The largest of the three drainages is Big Trout Creek Canyon. Flowing from south to north, Big Trout Creek runs the entire length of the study area nearly dividing the WSA in half. The stream has cut a large canyon which reaches a depth of 1,600 feet near the center of the study area.

To the west of Big Trout Creek is Mahogany Ridge.

This is one of the WSA's large flat-topped ridgelines. The eastern side of the ridge is quite steep and contains a number of small spring-fed drainages which flow into Big Trout Creek. It is to the north and west of this ridgeline, along the northwestern boundary, that the study area reaches its lowest elevation at 4,640 feet. In the southern end of the study area, a ridge named "The V" lies on the east side of Big Trout Creek. Near the WSA's southern boundary, "The V" ridge reaches an elevation of 8,192 feet, the highest point in the study area.

East of "The V" is the East Fork of Trout Creek. This major drainage originates within the study area and flows over 5 miles before it joins with the Big Trout Creek near the center of the WSA. The East Fork also flows through a large canyon which reaches its maximum depth of almost 1,300 feet near the confluence with Big Trout Creek.

Paralleling the East Fork and the lower reaches of Big Trout Creek is the study area's third major ridge, Center Ridge. This ridgeline primarily divides Big Trout Creek from Little Trout Creek which drains the northeastern corner of the WSA. Like the East Fork, Little Trout Creek also originates within the study area. Little Trout Creek flows through the smallest canyon of the three drainages, reaching a maximum depth of 740 feet.

There is a variety of vegetation within the Mahogany Ridge WSA. Although the dominant species in the study area is big sagebrush, each of the three major drainages includes a variety of riparian species. Other prevalent species include aspen in the higher elevations, and mountain mahogany along the steeper slopes of the ridgelines.

Interrelationships

The Mahogany Ridge WSA is adjacent to two other WSAs to the east and south: Disaster Peak (OR-3-153) and Willow Creek (OR-3-152) wilderness study areas. They are separated from the Mahogany Ridge study area by a BLM road. The road is primarily maintained by BLM and used by BLM personnel, livestock operators, private landowners, and recreationists (mostly hunters in the fall).

The U.S. Soil Conservation Service has a snow survey marker located within the study area, which is checked periodically by aircraft during the winter to determine snow depths. (Snow surveys provide information on snow moisture content for water supply forecasts.) Snow measurements by aircraft would be allowed to continue in wilderness as an established practice. Any other means of snow measurement or maintenance of snow survey markers would have to be by primitive means, such as by horseback or on foot. (Impacts on snow measurement surveys are not discussed further in this appendix.)

The Oregon Department of Fish and Wildlife (ODFW) conducts an annual aerial census to determine the size of the deer herd in the Trout Creek Mountains.

The U.S. Fish and Wildlife Service conducts a predator control program to control predator damage to livestock by aerially shooting coyotes.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- potential for developing geothermal or other mineral resources within the area, and

- the amount and location of private land in the area, which could preclude management as wilderness.

Also raised as an issue was the possibility of combining the Mahogany Ridge study area with adjacent WSAs to form one large wilderness.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- no wilderness/no action (preferred alternative)

The enhanced alternative does not analyze combining this study area with either of the two adjacent WSAs by closing the road between them. This road is necessary for both public access (to private land, for livestock management, and hunting) and BLM use and closing it would not be feasible.

A partial alternative is not analyzed because there is no reasonable opportunity to resolve resource conflicts by reducing the size of the WSA and still retain necessary wilderness qualities.

All Wilderness

This alternative would recommend all 27,210 acres of public land suitable as wilderness (see map 2). For purposes of analysis, it is assumed none of the private or split-estate inholdings would be acquired for wilderness purposes, and the six dead-end roads which enter the area would remain open.

Enhanced Wilderness

Under the enhanced wilderness alternative, 28,020 acres of public land would be recommended as suitable for wilderness (see map 3). This includes the 27,210 acres within the study area and an additional 810 acres of public land located on the northern and western sides of the WSA, which would also be recommended suitable under this alternative. Also, an attempt would be made to acquire 4,590 acres of private land and 740 acres of split-estate land, both within and adjacent to the WSA. These parcels could be acquired through purchase or exchange with willing landowners.

Assuming addition of public land outside the WSA and acquisition of private and split-estate land, the total area recommended suitable under this alternative would be 33,350 acres.

The acquisition of private and split-estate lands along the boundary would expand the boundary on the east, south, and western sides of the WSA to conform with Trout Creek Mountain Road. On the northeast, the boundary would follow the main road instead of the small road which currently bounds the area.

Acquiring both the inholdings and boundary parcels would greatly improve the manageability of the area because the boundary would be more identifiable; it would be along a major road instead of along legal subdivisions. The acquisitions under this alternative would also prevent the development of potential mineral resources on these lands and eliminate the need for access to the inholdings.

The enhanced alternative also includes closure of the dead-end roads which enter the area. This would enhance solitude in the area by restricting vehicle access (particularly during hunting season when vehicle use is heaviest).

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- construction of proposed livestock improvement projects, including spring developments,

- continued vehicle use in the WSA, and

- continued availability for mineral exploration and development (there has been interest in the area's geothermal potential).

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Table 1. Summary of Proposed Management Under Each Alternative, Mahogany Ridge WSA (OR-2-77)

Proposed Management	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	27,210	28,020	0
Acres Closed to ORVs by Wilderness Designation	27,210	28,020	0
Miles of Roads Closed	0	13.5	0
Miles of Ways Closed	12.5	12.5	0
Acres of Full Fee Estate Acquired [1]	0	4,590	0
Acres of Split Estate Acquired [1]	0	740	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	27,210	28,020	0
Structural Livestock Projects Developed: Springs (number)	0-2	0-2	2

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

Table 2. Summary of Environmental Consequences of Alternatives, Mahogany Ridge WSA (OR-2-77)

Resource or Activity	All Wilderness	Enhanced Wilderness	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 27,210 acres to the NWPS and preserve wilderness characteristics and special features, including wildlife and vegetation values and other features associated with Big and Little Trout Creeks. Closure of 12.5 miles of ways would enhance the naturalness of the area and increase opportunities for solitude and primitive types of recreation. Not manageable as wilderness under this alternative.	Would add 33,350 acres to NWPS, assuming addition of 810 acres public land outside the WSA and acquisition of 5,330 acres of private and split-estate land. Preserves all of the features identified in all wilderness alternative. Additionally, acquisition of inholdings and adjacent parcels would improve manageability and protect additional wilderness values and special features associated with the streams. Closure of 13.5 miles of dead-end road in addition to ways would have same effect as under the all wilderness alternative. The area would be manageable as wilderness under this alternative.	Wilderness values and special features would be subject to possible disturbance from potential developments of energy and mineral resources.
Energy and Mineral Development	Development precluded on 27,210 acres, including 27,210 acres with moderate potential for metals, 7,475 acres with moderate potential for geothermal, and 5,390 acres with moderate potential for diatomite.	Development precluded on 28,020 acres public land (including 810 acres of public land outside WSA), plus an additional 5,330 acres of private and split-estate land, if acquired. Includes 8,765 acres with moderate potential for geothermal, 5,690 acres with moderate potential for diatomite, and 28,020 acres with moderate potential for metals.	No Impact.
Livestock Grazing	Two spring developments might be precluded and 180 AUMs foregone within WSA. If not constructed, licensed use within allotment may decrease by up to 180 AUMs. Closure of ways would adversely affect livestock operator.	Same as all wilderness. Closure of ways would adversely affect livestock operator.	All proposed livestock improvements would be permitted, resulting in an increase of up to 180 AUMs. Overall licensed use within allotment would not change.
Recreation Use	Use of motorized vehicles for recreation would be restricted to dead-end roads. Some net reduction in overall recreation use as a result of prohibiting vehicle use on ways.	Vehicle-oriented recreation would be eliminated. Primitive recreation use would not increase sufficiently to offset the loss of vehicle-oriented recreation. Net reduction in overall recreation use.	No significant impacts. Existing motorized uses would continue. Primitive non-motorized uses would be subordinate to other activities.
Economic Value and Local Income	Decrease in economic value by $1,426 and no change in local personal income, if proposed projects are not constructed. Decrease in economic value by $633 and increase in local personal income by $1,507 if proposed projects are allowed. The maximum increase in transportation costs to ranchers with grazing permits would be $69.	Same as all wilderness.	Decrease in economic value by $564 and increase in local personal income by $1,507.

Manageability of the Area as Wilderness

The Mahogany Ridge WSA would not be manageable as wilderness under the all wilderness alternative. This is largely due to the extensive amount of private land which occurs within the study area's boundary and the location of those inholdings along the major drainages.

Almost all of the private inholdings in the Mahogany Ridge area are along the creeks in two of the study area's three major drainages (Big Trout Creek and the East Fork Trout Creek) where much of the recreation use would occur under wilderness designation. Few, if any, of the inholdings are fenced or otherwise marked to indicate private ownership. Management of recreation use under these circumstances would be extremely difficult.

Another management difficulty occurs along the northern and western boundaries, where the boundary is formed primarily by private land. In addition, the northern boundary also includes a 'finger' of private land which cuts into the study area along Big Trout Creek. In these areas, the boundaries are located along legal subdivisions which are not easily identified on the ground and, again, would be difficult to manage. Portions of the finger along Big Trout Creek are currently used for agricultural purposes.

Other substantial manageability problems under an all wilderness alternative include the potential for development of the study area's inholdings. All of the private and split-estate land would be available for development of other resources, which would not be compatible with wilderness management. Although no development is known to be planned at this time, it could include water resource development, energy and mineral development, and range improvements. Such developments would likely require access. Development and access would present extensive problems in managing the area as wilderness.

The area would be manageable as wilderness under the enhanced wilderness alternative. It would minimize, but not eliminate, the area's manageability problems. With extensive acquisitions of private and split-estate land, problems with boundary identification, recreation use, and potential development would be substantially reduced. The only portion of the WSA where manageability problems could still occur would be along the northern boundary where the study area is bounded by private land and where the finger of developed private land extends into the area along Trout Creek.

Rationale for Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because the Mahogany Ridge WSA is not manageable under the all wilderness alternative. The study area possesses a variety of high quality recreational opportunities, it offers opportunities for solitude, and it is in a basically natural condition. However, to the presence of private land inholdings and a boundary which is largely formed by private land, it would not be possible to manage the area to protect its wilderness values without the acquisition of an extensive amount of private land.

Affected Environment

This section discusses only those activities or resources which influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Mahogany Ridge WSA appears to be in a relatively natural condition. There are 48 man-made features within the WSA: 17 reservoirs, 9 spring developments, 10 ways (vehicle routes established and maintained solely by the passage of motor vehicles) totaling 12.5 miles, eight fences totaling 11 miles, one 350-acre crested wheatgrass seeding, the ruins of an old cabin, one corral, and an area with several old sheds. The developments are scattered throughout the study area except in the vicinity of Government Corrals where several are clustered. Approximately 8 percent of the study area is influenced by these man-made features. (The area of influence is an estimate of the acreage within the WSA from which each feature can be seen.)

Water developments influence about 4 percent of the WSA. Nine of the reservoirs and eight of the spring developments influence very small areas. The remaining water developments have an influence on larger areas because of their location in a bowl where they can be viewed from higher surrounding terrain.

The area around Government Corrals contains several old buildings, a large corral, a reservoir, a developed spring, several fences, and a way. Collectively, these developments influence less than 1 percent of the study area.

In the rest of the WSA, developments are small, scattered, and screened by the topography. The vehicle ways are visible only in their immediate vicinity. The crested wheatgrass seeding is overgrown with sagebrush and is not very noticeable.

Outside sights and sounds are not significant. The primary source of outside sights and sounds is the boundary roads. Additionally, ranching activities and the agricultural field near the north end of the WSA have a slight influence on the study area. These features do not detract from the wilderness character of the study area.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude in the Mahogany Ridge WSA are outstanding. These opportunities are enhanced by the study area's size, diverse topography, and vegetative screening.

Topographic screening is provided by the major canyons of Trout Creek and its tributaries, the rolling hills in the northwest, broken plateaus, and ridges. Vegetative screening enhances solitude in some portions of the WSA, mainly in the drainages, along the canyon walls, and scattered along the ridges. The rest of the WSA does not have vegetative screening.

The area provides outstanding opportunities for primitive recreation, including day hiking, backpacking, camping, hunting, and sightseeing.

Opportunities for day hiking within the Mahogany Ridge WSA are very good. Primary attractions include Big Trout Creek, Little Trout Creek, and the East Fork of Trout Creek. These canyons are very appealing with their aspen groves, mountain mahogany patches, and the riparian vegetation. Additional attractions are Pole and Cove Canyons located on the east side of Mahogany Ridge. These are intermittent drainages which flow into Big Trout Creek and contain aspen, mountain mahogany, and other shrubs. Three large flat topped ridges which separate the major drainages in the WSA provide excellent hiking. The terrain is diverse and the views are striking.

Backpackers would utilize much the same areas as day hikers. There are adequate water sources and plenty of level camping spots. The vegetation throughout the study area offers shelter and seclusion.

Game species which can be hunted within the study area include mule deer, antelope, and upland game birds. Opportunities for deer hunting are very good with excellent populations throughout the WSA. Opportunities for antelope hunting are good with above-average populations and moderate ease of hunter movement.

Opportunities for chukar hunting are best in the foothills and drainages of the study area. There are good populations of sage grouse in the WSA, but hunting them is regulated by the Oregon Department of Fish and Wildlife.

Big Trout Creek, Little Trout Creek, and East Fork Trout Creek all provide good fishing opportunities for hybrid cutthroat-rainbow trout.

Opportunities for sightseeing are outstanding in the Mahogany Ridge WSA. The diversity in terrain, from the broad mahogany covered plateaus to the aspen groves and riparian habitat of the deep creek canyons, creates many interesting views and viewpoints. Broad vistas with views of Steens Mountain, Pueblo Mountains, and the mountain ranges of northern Nevada are available from various high points in the WSA.

Special Features

Features in the Mahogany Ridge WSA which add to the value of this area as wilderness include vegetation and wildlife.

Two plant species of special interest, *Melica stricta* and *Allium bisceptrum*, are found in the WSA. (They are further discussed in the Vegetation section.)

The area contains crucial deer winter range and a sage grouse strutting ground. Crucial deer winter range is found on 800 acres around the Chalk Hills area in the northwest part of the WSA. A sage grouse strutting ground is located on the northeastern edge of the WSA, where sage grouse conduct an extensive courtship dance prior to mating. The same area is often used year after year, and the birds usually nest within a two-mile radius of the area.

The area contains habitat for kit fox, on the Oregon Department of Fish and Wildlife's List of Threatened Species, and the animals may range into the WSA at the lower elevations.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the study area is in the Intermountain Sagebrush Province, and the potential natural vegetation community is sagebrush steppe.

There are seven ecosystems identified in the Basin and Range section of the Oregon Natural Heritage Plan which occur in this WSA. The sagebrush communities are big sagebrush/Idaho fescue, low sagebrush/Idaho fescue, low sagebrush/Sandberg's bluegrass, and big sagebrush/bluebunch wheatgrass. The other communities are aspen grove, mountain mahogany in southern Basin and Range, and bitterbrush-sagebrush/snowberry on Trout Creek Mountains.

The study area is within 5 hours' driving time of two standard metropolitan statistical areas with populations over 100,000: Boise, Idaho and Reno, Nevada.

Energy and Mineral Development

The geology, energy, and mineral resources of the Mahogany Ridge WSA were evaluated by interpreting existing literature, reviewing past and present mining and mineral leasing records, correlating rock units in the WSA with similar environments in areas known to contain mineral resources, and by evaluating results of a geochemical sampling program conducted by the BLM. Technical details of the evaluation are in a mineral resources assessment report on Pueblo Valley Geological Resource Area (GRA OR-020-21), Harney County, Oregon, which was prepared by TERRADATA, a consulting firm under contract with BLM.

The WSA is within the Pueblo Valley geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA is rated moderately favorable for the occurrence of metals because the volcanic rocks present here belong to the same geologic formation that hosts occurrences of mercury, copper and gold in Alvord Peak WSA (OR-2-83). Mercury and copper are strategic and critical minerals, but there are no known deposits of strategic and critical minerals in the WSA.

The industrial mineral diatomite occurs in a sedimentary rock formation which extends into the northern part of the WSA. There is a diatomite mining prospect less than three miles northeast of the WSA. As of January 1, 1984, a total of eight mining claims were located in the WSA, associated with diatomite.

The northern part of this WSA is considered to have moderate geothermal potential. There were no oil and gas or geothermal leases issued in the WSA, as of January 1, 1984; however, two geothermal lease applications covering 2,520 acres were pending.

Table 3 shows the mineral potential classifications in the WSA. Map 4 shows the portion of the WSA rated moderate (medium) for geothermal resources.

Surface rocks in the WSA are Tertiary volcanic rocks consisting of basalt, andesite and rhyolite flows, tuffs, and tuffaceous sedimentary rocks with interlayers of ashy diatomite which represent lacustrine (lake) deposits.

Vegetation

On the rolling hills and slopes of the lower elevations is a big sagebrush/bunchgrass community. Estimated successional stage is early to mid-seral (a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in the succession of vegetation types.) The climax vegetation is big sagebrush, bluebunch wheatgrass, and Idaho fescue.

At higher elevations, the rolling hills with little or no

Table 3. Classification of Energy and Mineral Potential,Mahogany Ridge WSA (OR-2-77)

Commodity	Area	Classification Level	Confidence Level
Metals (mercury, copper, and gold)	Entire WSA	3	B
Geothermal	See map 4	3	C
	Rest of WSA	2	B
Uranium/Thorium	Entire WSA	2	B
Coal	Entire WSA	1	C
Oil/Gas	Entire WSA	2	A
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	C
Bentonite	Entire WSA	2	B
Diatomite	See map 4	3	C
	Rest of WSA	2	B
Zeolites	Entire WSA	2	A

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

slope are dominated by big sagebrush. The estimated successional stage is mid-seral. The primary climax species are Idaho fescue, western needlegrass, and big sagebrush.

The steeper mountain slopes are dominated by big sagebrush and mountain snowberry. The estimated successional stage is mid to late seral. Climax vegetation on the north slopes is Idaho fescue, Canby bluegrass, Cusick bluegrass, big sagebrush, and mountain snowberry. The primary climax species on the south slopes are Great Basin wildrye, big sagebrush and mountain snowberry.

A low sagebrush/bunchgrass community occurs on slopes where the soils are shallow and on exposed ridgetops. The estimated successional stage is mid-seral with the steeper slopes approaching late-seral. Primary climax species on the north slopes and the ridge tops are Idaho fescue, low sagebrush, and Sandberg's bluegrass.

On the south slopes, the climax species are bluebunch wheatgrass and low sagebrush. Curlleaf mountain mahogany dominates rocky flat tops and steep rock outcrops. Common understory species are needlegrasses, oniongrass, sagebrush, Sandberg's bluegrass, Idaho fescue, and squirreltail. The estimated successional stage is mid to late seral. The primary climax species are curlleaf mountain mahogany, needlegrasses, and Idaho fescue.

Aspen groves and meadows are interspersed in the mountain big sagebrush communities across the mountain slopes and ridge tops. The aspen groves have a limited understory of bluegrasses, mountain brome, and shade-tolerant forbs. The vegetation in the meadows is bluegrasses, sedges, slender wheatgrass, mat muhly and forbs. The estimated successional stage of both communities is mid-seral. The climax vegetation on the meadows is bluegrasses and sedges, and in the aspen groves is aspen and the associated shrubs.

The riparian community is a significant vegetation community found along three major streams. The major species include aspen, alder, willow, rose, sagebrush, and many species of grasses, sedges, and forbs. The estimated successional stage of the riparian zone is mid-seral. The major climax species are aspen, willow, grasses, and forbs.

Two plant species of special interest (mentioned in the Special Features section) have been discovered in the study area: *Allium bisceptrum* (two-stemmed onion), and *Melica stricta* (nodding melic). Both plants are on List 2 of the Oregon Natural Heritage Plan's "Rare, Threatened, and Endangered Plants and Animals of Oregon."

Wildlife

The WSA contains a wide variety of wildlife species due to the diverse habitat types. Mule deer summer on mid- and upper-elevation ranges on the Trout Creek Mountains and winter at low-elevation ranges on the north end of the WSA and outside of the WSA. The upper elevations of Trout Creek Mountains have a good interspersion of water, cover, and forage.

Pronghorn antelope summer on the low sagebrush covered ridges at mid to high elevations. These antelope winter out of the WSA.

Nongame mammals include coyote, black-tailed jackrabbit, mountain cottontail, northern pocket gopher, beaver, and Belding's ground squirrel.

Kit fox, on Oregon Department of Fish and Wildlife's List of Threatened Species, may range into the WSA at lower elevations.

Sage grouse are abundant during the summer in the low sagebrush and big sagebrush at mid- and high-elevation range. These birds winter at lower elevations in the north end of the WSA and out of the WSA. One sage grouse strutting ground has been located in the northeastern edge of the study area.

Chukars are found near canyons and rimrocks in the north end of the WSA near Trout Creek. Valley quail are also found in the north end near brushy drainages.

Raptors common to the area include golden eagle, red-tailed hawk, prairie falcon, American kestrel, and great horned owl.

Riparian habitat is found along 20.5 miles of stream on public land mostly along Big Trout Creek and Little Trout Creek. Bird species observed in the riparian habitat include common flicker, yellow warbler, yellow-rumped warbler, yellow breasted chat, dipper, common bushtit, western wood peewee, green-tailed towhee, white-crowned sparrow, yellow breasted sapsucker, Say's phoebe, and long-eared owl. Parts of the riparian habitat have extensive areas cleared by beaver. Beaver dams are common on most streams.

Twelve miles of stream in Big Trout Creek, Little Trout Creek, and the East Fork of Trout Creek contain hybrid cutthroat-rainbow trout.

Livestock Grazing

The WSA is located entirely within the Trout Creek Mountain grazing allotment. Table 4 shows existing and potential livestock use in AUMs (animal unit month, the amount of forage required by one cow and calf, or equivalent animals, for one month).

Existing livestock developments (among the man-made features discussed in the Naturalness section) include 17 reservoirs, 9 spring developments, and 11 miles of fence.

Two spring developments are proposed to be constructed within the study area. Their purpose is to improve livestock distribution and protect the spring sites from trampling by livestock. As a result, 180 AUMs additional livestock forage would be available in the WSA. However, licensed livestock AUMs in the allotment would not change.

The roads and ways within the study area are important access routes for the ranchers. Motor vehicles are often used within the WSA to distribute salt and supervise livestock. Horses are used to gather and move livestock within the study area.

Recreation Use

Existing recreational use in the Mahogany Ridge WSA is predominately hunting and fishing. Mule deer, antelope, and upland game birds are the most commonly hunted game species.

Deer hunting activity is high while antelope hunting activity is low. The Trout Creeks are a very popular limited-entry deer hunting area.

Hunting for chukars is excellent in the foothills and the drainages flowing out of the mountains, and this activity is moderate. A controlled sage grouse hunt (limited number of permits issued) was allowed in the fall of 1983 and the success rate was high.

Big Trout Creek, Little Trout Creek, and East Fork Trout Creek provide good fishing for cutthroat-rainbow hybrid trout. The fish are small but abundant and the angling success rate is high. Present recreation use levels are moderate and it is concentrated within the three major drainages. Nearly all of the East Fork, most of Big Trout, and a few portions of Little Trout Creek lie on private land, limiting fishing access in these areas.

Most of the hunters and fishermen use motorized vehicles along dead-end roads and ways for access.

Table 4. Existing and Potential Livestock Use, Mahogany Ridge WSA (OR-2-77)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Decrease in WSA (AUMs)
Trout Cr. Mountain (No. 6015)	13,369	71-9/30	33	3,900	180

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Limestone	Entire WSA	1	C
Bentonite	Entire WSA	2	B
Diatomite	See map 4	3	C
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slope are dominated by big sagebrush. The estimated successional stage is mid-seral. The primary climax species are Idaho fescue, western needlegrass, and big sagebrush.

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The roads and ways within the study area are important access routes for the ranchers. Motor vehicles are often used within the WSA to distribute salt and supervise livestock. Horses are used to gather and move livestock within the study area.

Recreation Use

Existing recreational use in the Mahogany Ridge WSA is predominately hunting and fishing. Mule deer, antelope, and upland game birds are the most commonly hunted game species.

Deer hunting activity is high while antelope hunting activity is low. The Trout Creeks are a very popular limited-entry deer hunting area.

Hunting for chukars is excellent in the foothills and the drainages flowing out of the mountains, and this activity is moderate. A controlled sage grouse hunt (limited number of permits issued) was allowed in the fall of 1983 and the success rate was high.

Big Trout Creek, Little Trout Creek, and East Fork Trout Creek provide good fishing for cutthroat-rainbow hybrid trout. The fish are small but abundant and the angling success rate is high. Present recreation use levels are moderate and it is concentrated within the three major drainages. Nearly all of the East Fork, most of Big Trout, and a few portions of Little Trout Creek lie on private land, limiting fishing access in these areas.

Most of the hunters and fishermen use motorized vehicles along dead-end roads and ways for access.

Table 4. Existing and Potential Livestock Use, Mahogany Ridge WSA (OR-2-77)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Decrease in WSA (AUMs)
Trout Cr. Mountain (No. 6015)	13,369	71-9/30	33	3,900	180

The WSA currently receives little primitive recreation use not associated with hunting or fishing. There are no estimates of visitor use which are associated with primitive recreation.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

The WSA currently produces 3,900 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually.

The economic value of existing outputs amounts to $29,406 annually and local personal income generated by existing outputs amounts to $32,526 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 27,210 acres to the National Wilderness Preservation System (NWPS). It would preserve wilderness qualities in the area's three major drainages, Big Trout Creek, Little Trout Creek and the East Fork of Trout Creek, along with their associated features including the tributaries, flat-topped divisional ridges, and aspen, mountain mahogany and riparian vegetation. Wilderness designation would improve or maintain the natural qualities of the area as well as the outstanding opportunities for solitude and primitive types of recreation.

Closure of 12.5 miles of ways would improve the naturalness of the area by eliminating most vehicle use and allowing the ways to revegetate. Vehicles would continue to be used on the ways to maintain existing livestock facilities if there were no practical alternatives, but this would be on a limited basis. Closing the ways would improve the quality of primitive recreation by reducing motor vehicle use.

Designation of the area under the all wilderness alternative would also protect the special features in their present condition. This would include the two plant species of special interest, crucial deer winter range and the sage grouse strutting ground.

The scenic values of the area would also be maintained by precluding major developments within the WSA. Potential mineral development or range improvements could be totally or partially eliminated under the all wilderness alternative. This would also maintain existing wilderness values throughout the area.

The Mahogany Ridge WSA would be unmanageable as wilderness under the all wilderness alternative due to the large amount of private land within the area, the location of those lands, and the extensive amount of private land which forms part of the study area boundary. Development of the private lands for livestock, minerals, or other purposes and construction of access to the lands would adversely affect wilderness values. Manageability of the area as wilderness is discussed in the Manageability section of this appendix.

The **enhanced wilderness alternative** would add 33,350 acres to the NWPS, assuming addition of 810 acres of public land outside the WSA and acquisition of 5,330 acres of private and split-estate lands. The consequences of this alternative are similar to the all wilderness alternative. However, this alternative would eliminate the possible development of and need for access to the scattered split-estate and private lands within the WSA through acquisition of these lands.

Most of the private and split-estate lands are located in areas having moderate favorability for the occurrence of metals, and this alternative would eliminate the potential for manageability problems related to development of or need for access to these inholdings.

In the enhanced wilderness alternative, closing of six roads totaling about 13.5 miles in addition to vehicle ways would eliminate vehicle use in the area and improve the manageability of the WSA by preventing vehicle intrusions on solitude. This would also improve the naturalness of the WSA by allowing the roads to revegetate.

Under the **no wilderness/no action alternative**, wilderness values and the special features, including the wildlife and vegetation identified as special features, of the entire WSA would be subject to disturbance from range improvements or possible development of mineral resources.

Any surface disturbing activities such as mining could affect the natural character of the area. Opportunities for solitude would be adversely affected as a result of any additional vehicle access and use. Depending on the location and extent of disturbance, primitive recreation values could be adversely affected.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development. Table 5 shows the acres that would be withdrawn under each alternative, including the acreages of areas rated moderate for minerals.

Effects on Livestock Grazing

Under the **all and enhanced wilderness alternatives**, the proposed spring developments might or might not be allowed, depending on a site-specific environmental assessment of whether they would conform with Wilderness Management Policy.

Table 5. Effects of Alternatives on Energy and Mineral Development, Mahogany Ridge WSA (OR-2-77)

	Acres Withdrawn		
	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
Total Acres	27,210	28,020 [1]	0
Metals rated moderate	27,210	28,020	0
Geothermal rated moderate	10,300	10,600	0
Diatomite rated moderate	5,390	5,690	0

[1] Includes 810 acres of public land to be added under this alternative. Development would also be precluded on an additional 5,330 acres if private and split-estate land is acquired, as proposed under this alternative.

If those developments were not allowed, the opportunity to make available an additional 180 AUMs in the study area would be foregone, possibly resulting in a decrease of licensed use of up to 180 AUMs within the allotment. The benefit/cost ratio of the developments is greater than 1:1.

Under the **no wilderness/no action alternative**, the proposed developments would be installed to protect the spring areas and extend the spring flows later into the season, making available an additional 180 AUMs. Overall, licensed livestock AUMs in the allotment would not change.

Inconclusive range survey data show that grazing could exceed the present carrying capacity in the Trout Creek allotment by approximately 6,500 AUMs (about 49 percent of the total licensed grazing use). Even if all of the proposed developments in the allotment were implemented, the additional forage gained in ten years would not be enough to offset the apparent excess livestock use. The preliminary estimate of the amount of apparent overgrazing is subject to refinement as the effects of future livestock grazing in the allotment are monitored. The proposed projects within the WSA would marginally contribute to alleviating this problem.

Under the all and enhanced wilderness alternatives, the interior roads and ways would be closed, allowing the grazing operator to use motor vehicles only on boundary roads. This would be inconvenient to the grazing operator since some of the roads to be closed are used frequently each year for spreading salt and for livestock supervision. The only exception to the road closures would be that the operator would be allowed to use vehicles on a limited basis if there were no practical alternatives.

Effects on Recreation Use

The quality of and opportunities for primitive recreation in the study area would be maintained or improved under the **all wilderness alternative**. Improvements in the quality of primitive recreation would be a result of eliminating vehicles on ways throughout the WSA.

The all wilderness alternative would reduce vehicle-oriented recreation from the area, mostly affecting hunting for deer and antelope. Fishing opportunities would be adversely affected, but not as much as hunting, because fishermen generally hike further than do hunters. Some of the reduction in vehicle-oriented hunting would be offset by increased use from hunters who prefer nonmotorized access to their hunting area.

The **enhanced wilderness alternative** would further improve the quality of primitive recreation by also closing six dead-end roads which total about 13.5 miles. Reductions in vehicle-oriented recreation would be greater under the enhanced wilderness alternative because interior dead-end roads would be closed.

Because of the vehicle restrictions in both the all and enhanced wilderness alternatives, it is expected that overall recreational use would decline under both alternatives; but this decrease is greatest under the enhanced wilderness alternative. Existing use of the area for primitive types of recreation is very low, and it is not anticipated that such use of the area would substantially increase. Any increase in primitive recreation would not be sufficient to offset the reduction in vehicle-oriented recreation.

Under the **no wilderness/no action alternative**, primitive recreation would be subject to continued disturbance by existing vehicle access routes and use. Primitive recreation activities would be further disturbed by planned range improvements. Vehicle-oriented recreation could benefit from additional access associated with the development of range improvements. Overall recreation use would not be significantly affected.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 6 and 7. Table 6 shows the effects on economic value and table 7, the effects on local personal income. It is not known at this time whether individual proposed structural developments, such as the springs proposed for this WSA, would be constructed if the area were designated wilderness.

The column for the all wilderness and enhanced wilderness alternatives shows the effects as a range of values dependent upon whether structural improvements and grazing operator access were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The all and enhanced wilderness alternatives would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $69 per year.

Table 6. Effects of Alternatives on Annual Economic Value, Mahogany Ridge WSA (OR-2-77) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +180	+180
Adjustment [2]	AUM	-180	-180
VALUE OF PLANNED INVESTMENTS [3]			
Grazing	$	0 to +1,357	+1,357
Investments [4]	$	0 to -564	-564
Net Economic Value	$	0 to +793	+793
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS			
Grazing:			
Adjustment	$	-1,357	-1,357
Reduced access [5]	$	-69	0
Total	$	-1,426	-1,357
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS			
All categories [6]	$	-1,426 to -633 (-69 to 0)	-564 (0)

[1] Expected future increases due to range improvement investments.
[2] Adjustment for possible reduction in grazing is based on inconclusive data and may not be necessary.
[3] Structural projects involving up to $7,000 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[4] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.
[5] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.
[6] See footnote 2. If the grazing adjustment is found to be unnecessary, compensating improvements would not be developed. Investments and grazing adjustments would be zero. The effects of this case are shown in parentheses.

Table 7. Effects of Alternatives on Local Personal Income, Mahogany Ridge WSA (OR-2-77) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +180	+180
Adjustment [2]	AUM	-180	-180
INCOME FROM PROPOSED INVESTMENTS [3]			
Grazing	$	0 to +1,507	+1,507
Construction activity [4]	$	0 to +941	+941
Total [5]	$	0 to +1,507	+1,507
INCOME FROM OTHER EXPECTED OUTPUT CHANGES			
Grazing:			
Adjustment	$	-1,507	-1,507
INCOME FROM ALL IN OUTPUT CHANGES			
All categories [6]	$	-1,507 to 0 (0)	0 (0)

[1] Expected future increases due to range improvement investments.

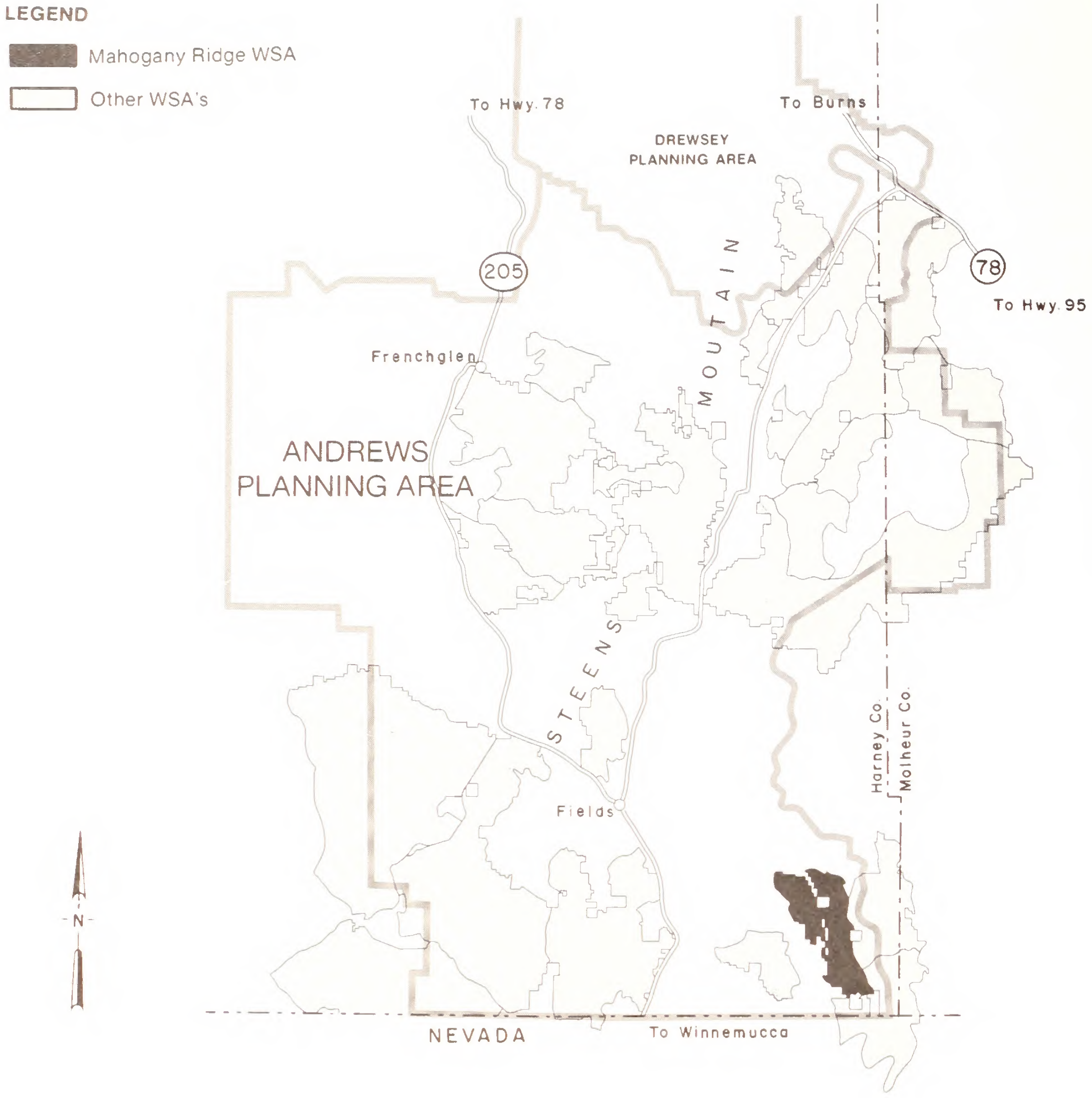
[2] Adjustment for possible reduction in grazing is based on inconclusive data and may not be necessary.

[3] Structural projects involving up to $7,000 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[5] Total omits income from construction which is limited to 5-year period. See footnote 4.

[6] See footnote 2. If the grazing adjustment is found to be unnecessary, compensating improvements would not be developed. Investments and grazing adjustments would be zero. The effects of this case are shown in parentheses.



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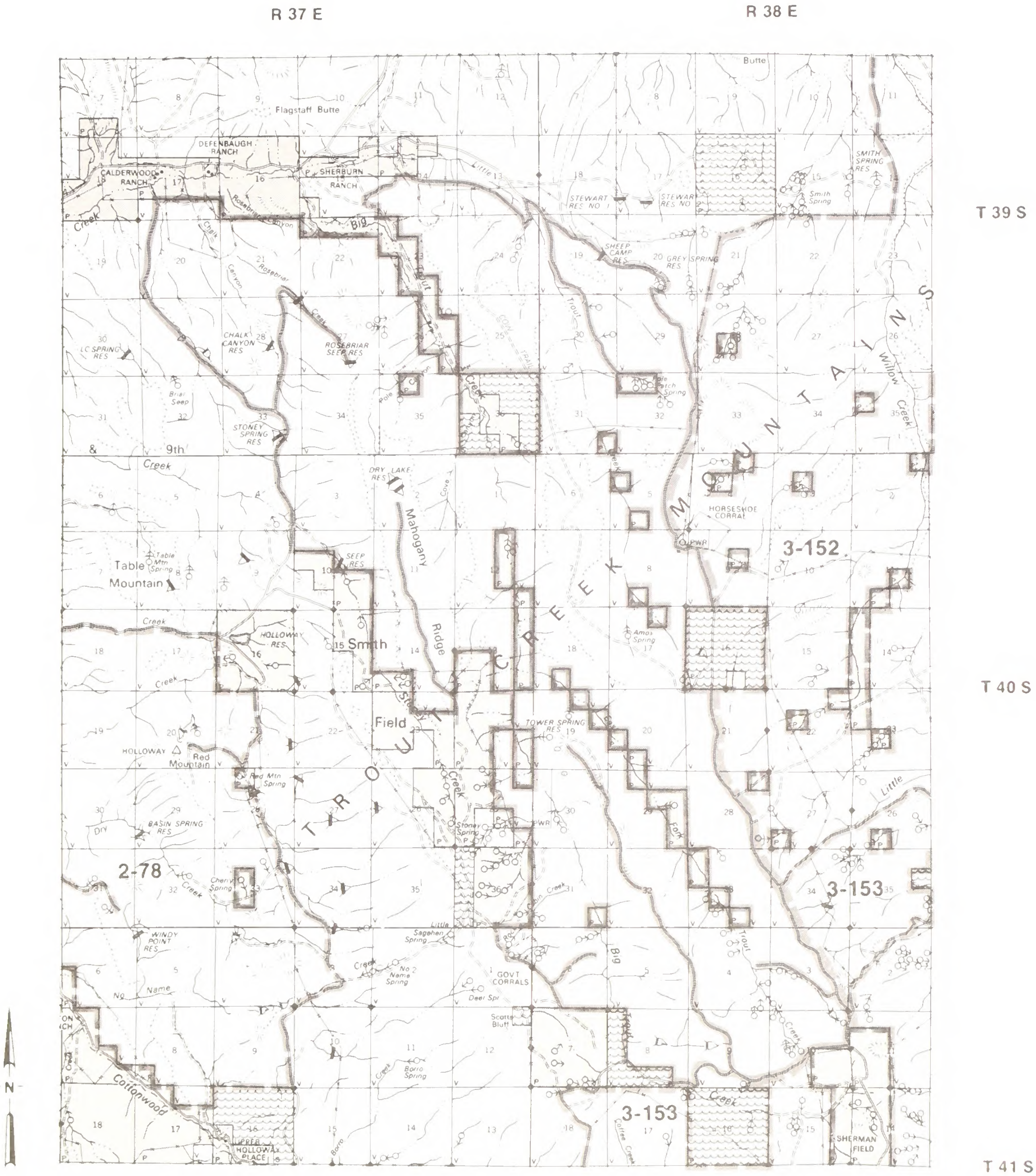
Burns District

Mahogany Ridge WSA
OR-2-77

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

╌ Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

☐ Private

▨ BLM Surface-State or Private Subsurface (Split Estate)

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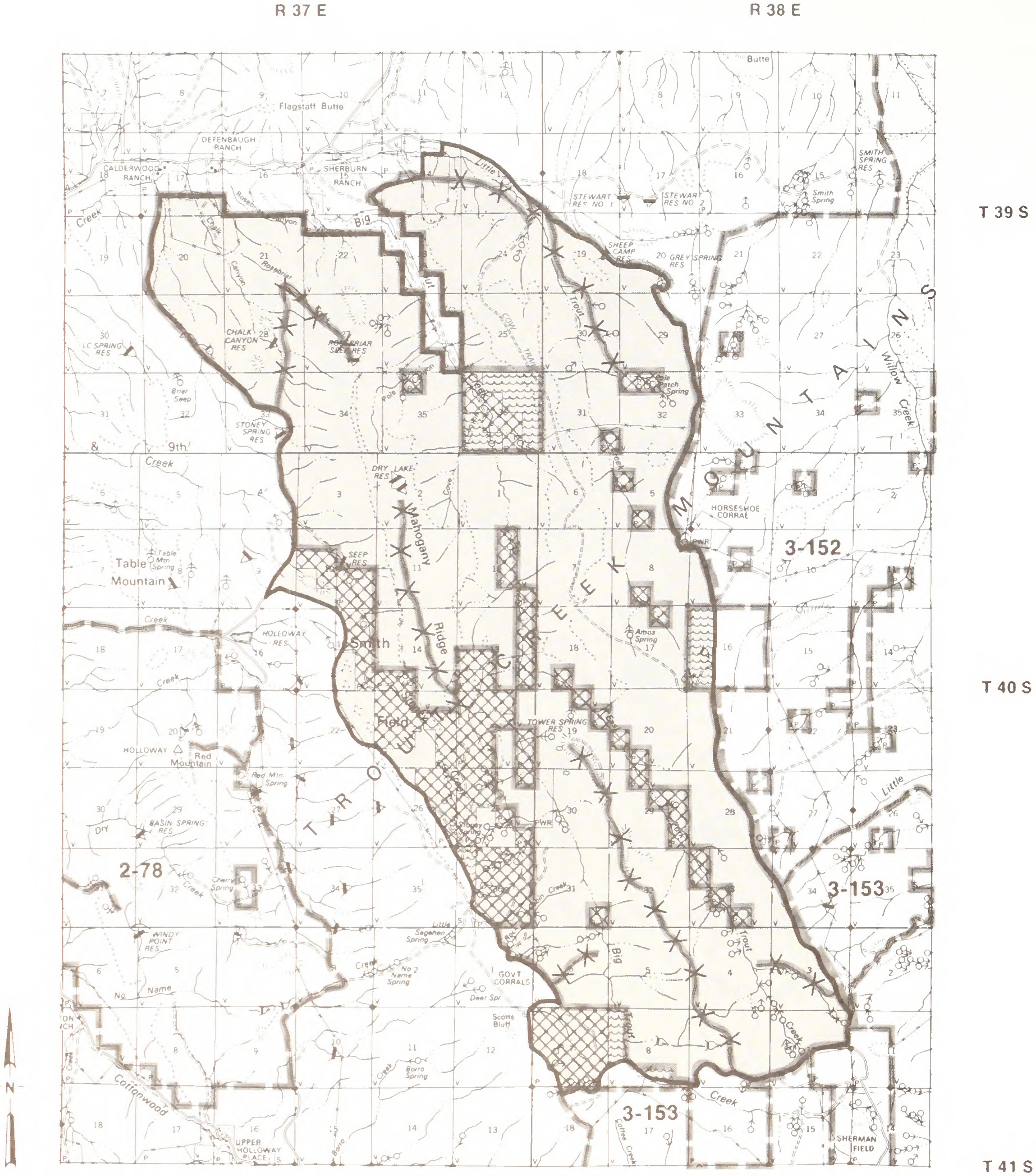
Mahogany Ridge WSA
OR-2-77

LAND OWNERSHIP

MAP 2



LEGEND

▬ Wilderness Study Area Boundary

╍ Boundary of Adjacent Wilderness Study Areas

☐ Recommended Suitable for Wilderness

▨ Non-Federal Land within Recommended Wilderness

▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

✕ Recommended Road Closure

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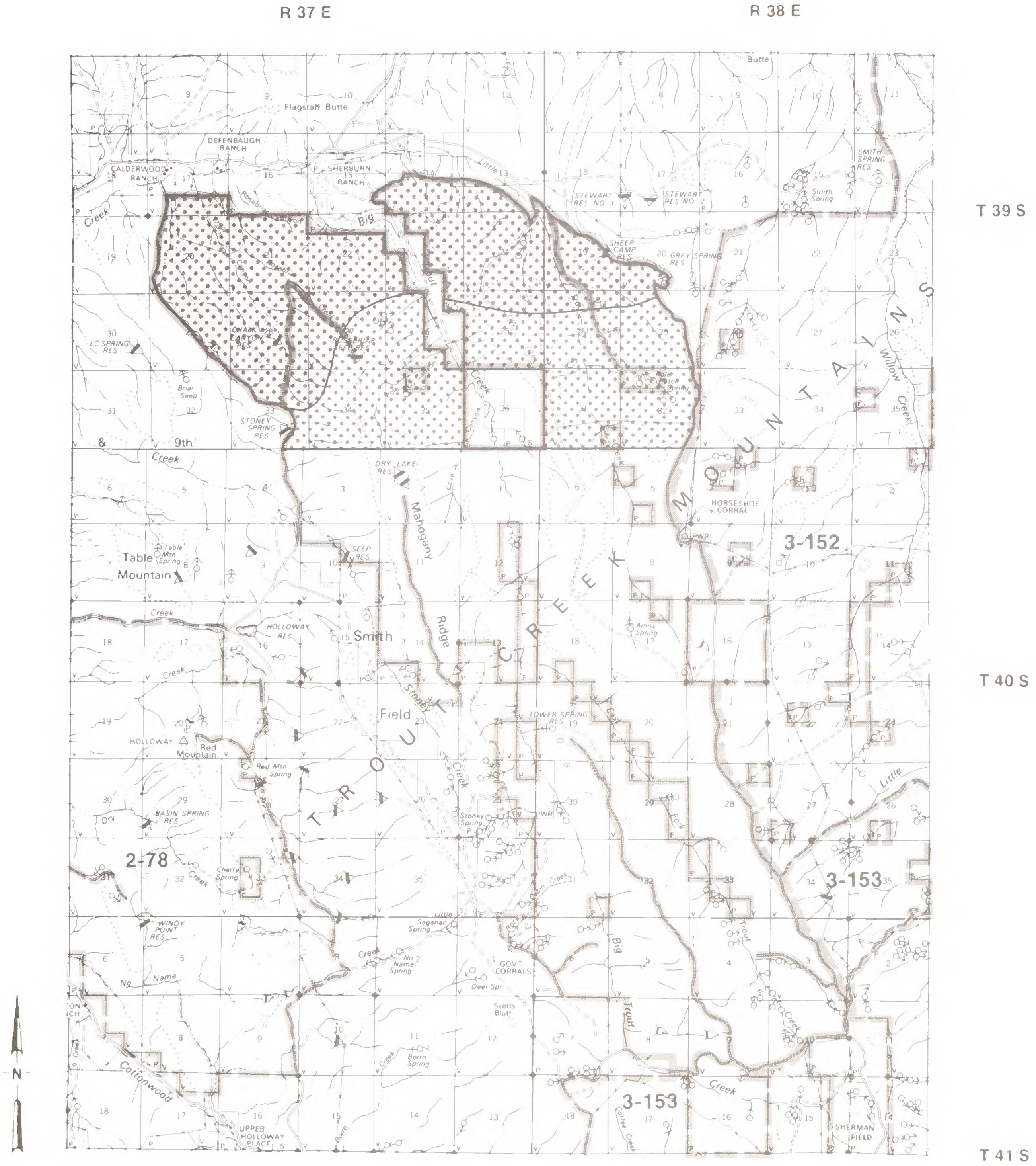
Mahogany Ridge WSA
OR-2-77

ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3



Medium Potential (3C) for Diatomite

Medium Potential (3C) for Geothermal Resources

Entire WSA:
Medium Potential
(3B) for Mercury

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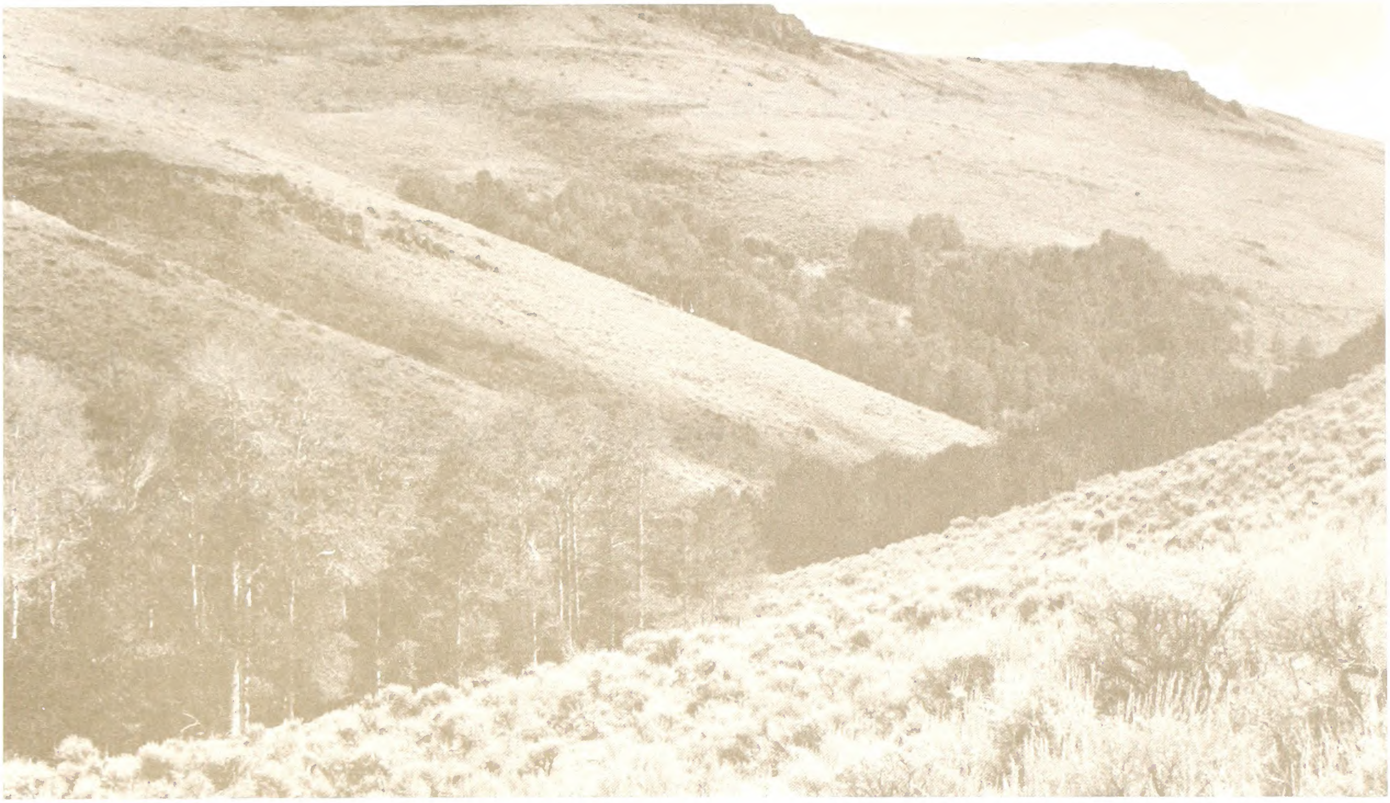
Mahogany Ridge WSA
OR-2-77

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

MAP 4

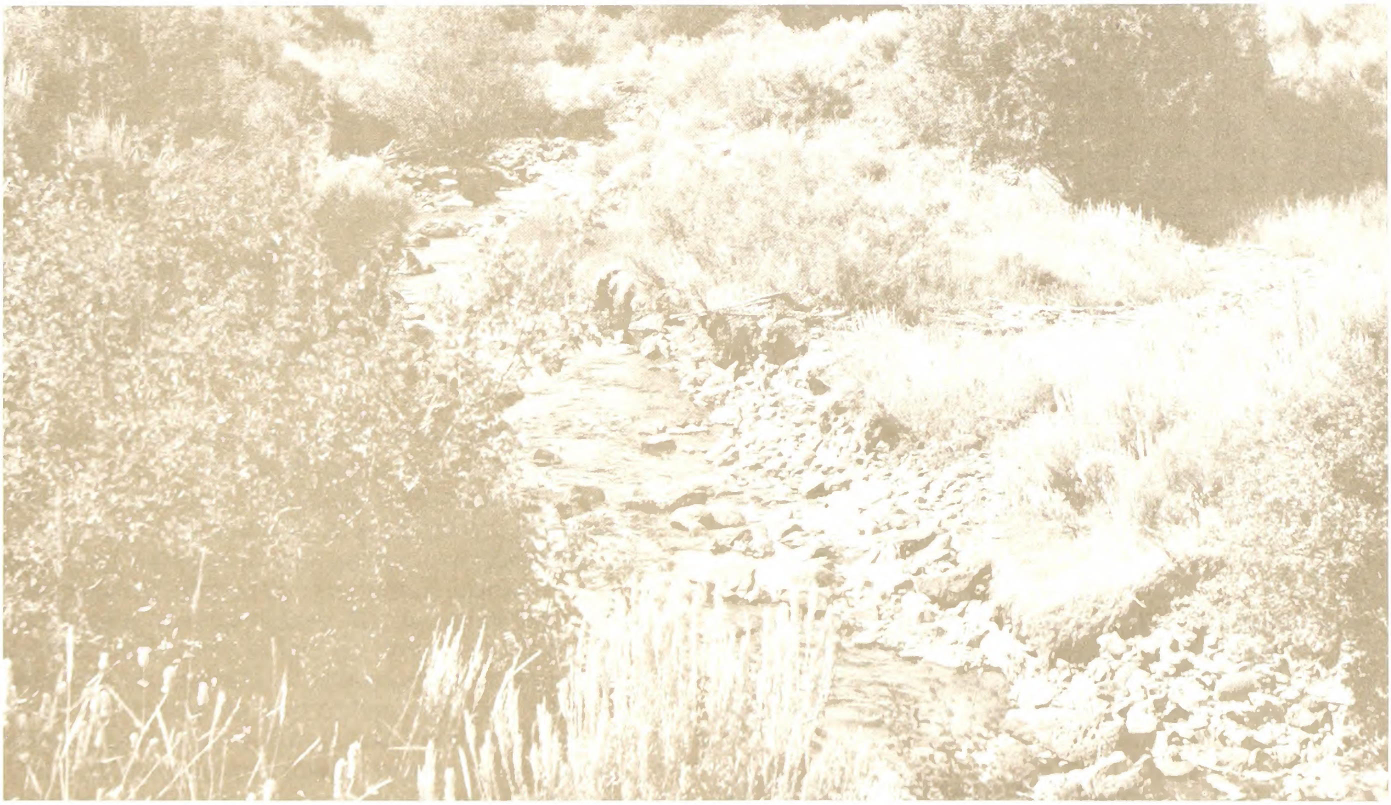
Mahogany Ridge WSA, OR-2-77. Looking to the southeast from the eastern side of Mahogany Ridge, primarily showing Cove Canyon, a small tributary drainage to Big Trout Creek. Within the area recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. The ridgeline to the left of center is V Ridge, bounded by Big Trout Creek on the right and the East Fork of Trout Creek on the left. Center Ridge is on the left. August 1983.

Mahogany Ridge WSA, OR-2-77. Bounded by Center Ridge on the left, this view of Little Trout Creek is to the north looking downstream. Within the area recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. Little Trout Creek winds its way through the northeastern corner of the study area. Several small parcels of private land are located within the drainage and include portions of the creek. August 1983.



Mahogany Ridge WSA, OR-2-77. Looking southeast across the Little Trout Creek drainage. Within the area recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative.

Aspen groves in Little Trout Creek provide increased opportunities for solitude, summer shade, cover for wildlife, and add to the scenic values of the area. August 1983.



Mahogany Ridge WSA, OR-2-77. Big Trout Creek looking north from about two miles south of the confluence with the East Fork. The area is recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. Big Trout Creek runs through the entire length of the study area. In this area the canyon is 400 to 500 feet deep. August 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Red Mountain Wilderness Study Area (OR-2-78)

General Description of the Study Area

The Red Mountain wilderness study area is located 105 miles southeast of Burns (about six miles northeast of Denio, Nevada) in Harney County (see map 1). The nearest highway is Nevada State Highway 140 which is 12 miles southwest of the WSA.

The study area contains 14,730 acres of public land and is roughly triangular in shape (see map 2). It contains one 80-acre parcel of private land, located near the eastern boundary.

The area's northern boundary is formed by a combination of two BLM roads and an irrigation ditch and pipeline. The eastern boundary is comprised of BLM roads, a small parcel of private land, and a parcel of split-estate land (federally managed surface, state or privately owned subsurface mineral rights). About half of the southern boundary is formed by private land, although two parcels of split-estate land and BLM roads also make up part of the boundary. The western boundary is formed by a county road. Three short dead-end roads, totaling 2 1/2 miles, enter the study area and make up part of the boundary (one each from the north, east and south).

The study area lies on the southwest edge of the Trout Creek Mountains adjacent to the Pueblo Valley. The dominant topographic feature is Red Mountain which rises to 6,280 feet. Located near the WSA's eastern boundary, Red Mountain is the highest point in the study area. This mountain's ridgeline extends southeast for nearly two miles, with areas of rock outcroppings. West of Red Mountain, the entire middle portion of the area consists of numerous ridges and hills. Flat lowlands occur in the extreme western portion of the area where the WSA reaches its lowest elevation of 4,240 feet.

No perennial streams are found within the study area. Cottonwood Creek is a perennial stream, but it lies south of the boundary. Four intermittent creeks, Oreanna, Red Mountain, Dry, and No Name, drain the western portion of the area. These creeks or their tributaries have cut into the topography of the WSA and provide some topographic variety.

The dominant vegetation is big sagebrush with a variety of grasses making up the understory vegetation. There are two springs within the area which have patches of aspen and chokecherry.

Interrelationships

The Oregon Department of Fish and Wildlife (ODFW) conducts a census of wintering deer in the

WSA. The counts are taken annually by air.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values.

The only issue specifically raised for this WSA was potential energy and mineral development in the study area.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- no wilderness/no action (preferred alternative)

A partial alternative is not analyzed because there are no opportunities to resolve resource conflicts by reducing the size of the study area and still retain the necessary wilderness values.

All Wilderness

The all wilderness alternative would recommend all 14,730 acres of public land in the WSA as suitable for wilderness (see map 2). For purposes of analysis, it is assumed the three dead-end roads which penetrate the area would remain open to vehicle use and the 80 acres of private land would not be acquired.

Enhanced Wilderness

The enhanced wilderness alternative would recommend all 14,730 acres of public land in the WSA and an additional 440 acres of public land outside of the WSA suitable for wilderness (see map 3). In addition, an attempt would be made to acquire the 80-acre private inholding and an adjacent 600-acre parcel of split-estate land along the central part of the southern boundary. Both parcels could be acquired through purchase or exchange with willing owners. The three dead-end roads would be closed.

Assuming acquisition of the private and split-estate land, and addition of the public land outside the WSA, total area recommended suitable under this alternative would be 15,850 acres.

The southern boundary would be adjusted to conform with the private land along Cottonwood Creek.

The enhanced wilderness alternative would improve the manageability of the study area by eliminating the potential for mineral development on the private inholding and on the split-estate parcel which cuts into the southern portion of the area. Closing the dead-end roads would eliminate vehicle use within the study area (current use is minimal), improving the opportunities for solitude and primitive recreation.

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued unrestricted vehicle use in the WSA,

- construction of proposed livestock projects, including 2 spring developments, and

- continued availability for mineral exploration and development.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The Red Mountain WSA is manageable as wilderness under the all wilderness alternative, although there are some potential manageability problems. One of the problems is the 80-acre parcel of private land. Because the area has

Table 1. Summary of Proposed Management Under Each Alternative, Red Mountain WSA (OR-2-78)

Proposed Management	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	14,730	15,170	0
Acres Closed to ORVs by Wilderness Designation[	14,730	15,170	0
Miles of Roads Closed	0	2.5	0
Miles of Ways Closed	7	7	0
Acres of Full Fee Estate Acquired [1]	0	80	0
Acres of Split Estate Acquired [1]	0	600	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	14,730	15,170	0
Structural Livestock Projects Developed: Springs (number)	0-2	0-2	2

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

moderate potential for the occurrence of some mineral resources, possible development of and the need for access to this parcel could cause difficulties in managing the area to preserve its wilderness character. This is also true for the split-estate parcel which cuts into the study area from the southern boundary. (There is no known development planned for either of these parcels.)

There probably would be no substantial manageability problems resulting from the study area's common boundary with private land along the south. Although this boundary falls along legal subdivisions and is not easily identified on the ground, it is not within a portion of the study area expected to attract recreation. Management problems with other portions of the boundary which fall along legal subdivisions would also be slight.

Under the enhanced wilderness alternative, the manageability of the WSA would be improved with the acquisition of the inholding. There still would be minor problems with boundary identification.

Rationale for Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred for the Red Mountain WSA largely because the benefits of retaining options for resource development and the use of motorized vehicles in the area outweigh the benefits of preserving wilderness values. Although this area met the minimum criteria for designation as a wilderness study area, the WSA has a relatively small number of wilderness values. The study area has the potential for development of other resources, including range improvements for livestock grazing and mineral development.

Affected Environment

This section discusses only those activities or resources which influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Red Mountain WSA appears to be in a relatively natural condition. Generally, the developments are scattered, screened by topography, and can be seen from only small, localized areas.

Man-made features in the WSA include 6 reservoirs, 4 developed springs, 3 ditches totaling about 2 miles, one-eighth mile of pipeline with a trough, about 6 miles of fence, a 680-acre crested wheatgrass seeding, 1 cabin, and 7 ways (a vehicle route established and maintained solely by the passage of motor vehicles) totaling about 7 miles.

It is estimated that approximately 13 percent of the study area is influenced by these features. (The area of influence is an estimate of the acreage within the WSA from which these man-made features can be seen.)

The 3 ways and 3 ditches occur in the flat lowland area on the west; they are overgrown and visible only in their immediate vicinity. If the ditches were maintained with heavy equipment in the future, they would become more noticeable.

The crested wheatgrass seeding is overgrown by sagebrush and is not substantially noticeable; but, due to its size (680 acres), it influences about 5 percent of the WSA. The seeding can be seen from adjacent hills to the east and south. From the top of Red Mountain, it is visible in the distance.

Topography screens the reservoirs, spring

Table 2. Summary of Environmental Consequences of Alternatives, Red Mountain WSA (OR-2-78)

Resource or Activity	All Wilderness	Enhanced Wilderness	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 14,730 to NWPS. Maintain or improve quality of wilderness characteristics of physical features, such as Red Mountain, and special features, including the crucial deer and antelope winter range. Closure of 7 miles of ways would enhance the area's naturalness and improve opportunities for solitude and primitive types of recreation. There would be minor manageability problems associated with inholdings and adjacent private land, but the area would be manageable as wilderness.	Would add 15,850 acres to NWPS, assuming acquisition of 680 acres of private and split-estate land and addition of 440 acres of public land outside the WSA. Preserves all of the features identified in all wilderness alternative. Improves manageability by acquiring inholdings and adjacent parcels and relocating boundary. Closure of the ways would have the same effect as under the all wilderness alternative; closure of 2 1/2 miles of dead-end roads would have additional beneficial effects.	Wilderness values and special features would be subject to possible disturbance from potential development of energy and mineral resources.
Energy and Mineral Development	Development precluded on 14,730 acres including 14,730 acres with moderate potential for metals, and 5,692 acres with moderate potential for diatomite.	Development precluded on 15,170 acres, (including 440 acres additional public land) plus an additional 680 acres if private and split-estate land is acquired. Includes 15,170 acres with moderate potential for metals, and 6,132 acres with moderate potential for diatomite.	No impact.
Livestock Grazing	Two proposed spring developments might be precluded and 200 AUMs foregone. If not constructed, licensed use in allotment may decrease by up to 200 AUMs.	Same as all wilderness.	Two proposed spring developments would be permited, resulting in availability of 200 additional AUMs. Overall licensed use in the allotment would not change.
Recreation Use	Use of motorized vehicles restricted to dead-end roads. No significant impact.	Motor vehicles eliminated from study area. No significant impact.	Existing recreation uses of the area would continue. No significant impact.
Economic Value and Local Income	Decrease in economic value and local personal income by $1,633 and $1,674, respectively, if proposed projects are not constructed. Decrease in economic value by $368 and increase in local personal income by $145 if proposed projects are allowed. The maximum increase in transportation costs to ranchers with grazing permits would be $125.	Same as all wilderness.	Decrease in economic value by $243 and increase in local personal income by $145.

developments, ways, and fences in the eastern two-thirds of the area. The pipeline, trough, cabin, and way in Red Mountain Creek drainage are visible from the higher points above each development. Three of the 6 reservoirs are very small. Generally, the ways lie in drainages, are partially screened by the curves in the drainages and by sagebrush vegetation, and can only be seen from high hills above the drainage itself. The fences are visible only in their immediate vicinity.

Outside sights and sounds which influence the study area are not substantial. The primary source of outside sights and sounds are the boundary roads and the 3 dead-end roads. Distant ranching activities also can be seen.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude in the Red Mountain WSA are outstanding. These opportunities are enhanced by the area's size, configuration and diverse topography, particularly Red Mountain, the numerous ridges and rolling hills, and the four major drainages with side drainages. There is limited vegetative screening to enhance opportunities for solitude. Trees grow around the springs within the WSA, but are not sufficient to provide screening.

Red Mountain WSA has outstanding opportunities for day hiking and sightseeing. The major attraction for day hiking is Red Mountain and the ridgeline extending southeast for about two miles. Portions of four intermittent drainages lie within the WSA. These drainages are Oreanna Creek, Red Mountain Creek, Dry Creek and No Name Creek. The latter three drainages provide additional hiking routes, as does the ridgeline north of No Name Creek.

There are outstanding opportunities for sightseeing and photography. These are associated with viewing areas outside of the WSA. From the top of Red Mountain and the ridge south of the summit, the view includes the Steens Mountain to the north, Pueblo Valley and Pueblo Mountains to the west, and the mountains of northern Nevada to the south.

There are opportunities for other activities such as hunting, but they are not outstanding.

Special Features

Wildlife is a special wilderness feature in the WSA because the area contains crucial deer and antelope winter range. Crucial deer winter range occurs in the extreme western lowlands, in the southwest near No Name Creek and in the hills above Cottonwood Creek. The northwest portion of the WSA provides crucial antelope winter range.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the study area is in the Intermountain Sagebrush Province. The potential natural vegetation is sagebrush steppe or saltbush-greasewood communities.

Seven ecosystems listed in the Basin and Range section of the Oregon Natural Heritage Plan (ONHP) occur in Red Mountain WSA: big sagebrush/bluebunch wheatgrass, big sagebrush/Idaho fescue, big sagebrush-bitterbrush/Idaho fescue, low sagebrush/Idaho fescue, low sagebrush/Sandberg's bluegrass, bitterbrush-sagebrush/snowberry on Trout Creek Mountains, and shadscale-spiny hopsage-budsage community complex. Three-tip sage/Idaho fescue is a notable ecosystem in the WSA but is not listed in the ONHP.

The study area is within 5 hours' driving time of two standard metropolitan statistical areas with populations over 100,000: Boise, Idaho and Reno, Nevada.

Energy and Mineral Development

The geology, energy and mineral resources of the Red Mountain WSA were evaluated by interpreting existing literature, reviewing mining and mineral leasing records, correlating rock units in the WSA with similar environments in areas known to contain mineral resources, and by evaluating results of a geochemical sampling program conducted by BLM. Technical details of the evaluation are in a report on the Pueblo Valley Geologic Resource Area, Harney County, Oregon, prepared by TERRADATA, a consulting firm under contract with BLM.

The WSA is within the Pueblo Valley geologic resource area, which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA is rated moderately favorable for the occurrence of metals because the volcanic rocks present here belong to the same geologic formation in which mercury, copper and gold occurrences are found in the Alvord Peak WSA (OR-2-83). Mercury and copper are strategic and critical minerals; but there are no known deposits of strategic and critical minerals in the WSA.

Table 3 shows the mineral potential classifications in the WSA. Map 4 shows the portion of the WSA rated moderate (medium) for diatomite.

Ashy diatomite occurs in sedimentary rocks exposed in the western part of the WSA; there is potential for higher quality diatomite deposits in these same rocks. The sedimentary formation that contains diatomite deposits in Mahogany Ridge WSA (OR-2-77) also occurs along the southeast edge of this WSA, but no significant diatomite deposits have been reported here.

There were no oil and gas or geothermal leases and no mining claims in the area as of January 1, 1984.

Table 3. Classification of Energy and Mineral Potential, Red Mountain WSA (OR-2-78)

Commodity	Area	Classification Level	Confidence Level
Metals (mercury)	Entire WSA	3	B
Geothermal	Part of area (Not shown on map 4)	2	B
	Rest of WSA	1	D
Uranium/Thorium	Entire WSA	2	B
Coal	Entire WSA	1	C
Oil/Gas	Entire WSA	2	A
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	C
Bentonite	Entire WSA	2	B
Diatomite	See map 4	3	C
	Rest of WSA	2	B
Zeolites	Entire WSA	2	A

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

Surface rocks in the WSA are Tertiary volcanic rocks consisting mainly of basalt, andesite and rhyolite flows with minor tuffs and tuffaceous sandstone and siltstone, ashy diatomite and conglomerate, and Quaternary deposits of unconsolidated sand, silt and gravel.

Vegetation

The most extensive community in the Red Mountain WSA is the big sagebrush/bunchgrass community. Idaho fescue is dominant on north slopes and bitterbrush is co-dominant with sagebrush around Red Mountain. The estimated successional stage is mid-seral at the lower elevations and on the areas without much slope. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) The steeper slopes are estimated to be mid to late seral. Climax vegetation is big sagebrush, bluebunch wheatgrass, Idaho fescue on the north slopes, and bitterbrush.

A low sagebrush/bunchgrass community occurs on the slopes with shallow soils. The estimated successional stage is mid-seral. The primary climax species are Idaho fescue and low sagebrush.

A three-tip sagebrush community occurs on small north-facing slopes throughout the study area. The estimated successional stage is mid-seral. The climax community contains Idaho fescue, Cusick bluegrass, Sandberg's bluegrass, and three-tip sagebrush.

The alluvial fans on the western side of the study area support a community dominated by shadscale and budsage. The estimated successional stage is mid-seral. The primary climax species are Indian ricegrass, squirreltail, budsage, and shadscale.

Wildlife

This WSA provides winter habitat for large numbers of mule deer in the areas north of Cottonwood Creek and on the lower slopes west of Red Mountain. Deer use occurs during the summer months along the eastern edge of the study area where water is well distributed and thermal cover is adequate.

Antelope winter at lower elevations in the northwestern part of the WSA. Most of the summer antelope use occurs near Holloway Reservoir and on low sagebrush flats in the southeastern edge of the study area.

Small mammals common to the low elevation valley edge include antelope ground squirrels, black-tailed jackrabbits, and kangaroo mice. Bushy-tailed wood rats, canyon mice, and small-footed myotis (bat) inhabit the rocky uplands. Coyotes are common throughout the WSA.

Reptiles found throughout the WSA are bullsnake, western rattlesnake, and Great Basin whiptail lizard.

Kit fox, which is on the Oregon Department of Fish and Wildlife's List of Threatened Species, may occur along the west edge of the area.

Sage grouse nest in upper elevations of the WSA and winter at lower elevations. Chukar are abundant along the drainages. Valley quail are abundant along Cottonwood Creek, but range onto uplands in the WSA.

Songbirds include those common to the lower elevations of the Pueblo Valley, such as horned lark, western kingbird and lark sparrow. Species found along canyons and uplands are canyon wren, rock wren, and cliff swallow. Raptors nest on the large cliff faces near Red Mountain. Golden eagles, American kestrels, prairie falcons and ravens nest in the WSA.

Livestock Grazing

The WSA is located entirely within the Trout Creek Mountain grazing allotment. Table 4 shows existing and potential livestock use in AUMS (animal unit month, the amount of forage required by one cow and calf, or equivalent animals, for one month).

Two spring developments are proposed within the study area. These developments would improve livestock distribution in the allotment and protect the spring sites from trampling by livestock. As a result, 200 AUMs additional livestock forage would be available in the WSA. However, licensed livestock AUMs in the allotment would not change.

Existing livestock developments (among the man-made features discussed in the Naturalness section) include: 6 reservoirs, 4 spring developments, 3 ditches, a pipeline with a trough, 6 miles of fencing, and a crested wheatgrass seeding.

The roads and ways are not used extensively by grazing operators. Horses are used for almost all of the livestock management in the portion of the allotment within the WSA.

Recreation Use

Recreational use in the Red Mountain WSA is primarily oriented toward hunting. Mule deer, antelope and upland game birds are the most commonly hunted game species.

Hunting for chukar and deer is fair, because populations are not high. It is estimated that deer hunting accounts for moderate visitor use while chukar hunting accounts for low visitor use. Antelope populations are even lower than deer populations, and antelope hunters account for low visitor use.

Hunting is associated with vehicles. The 2 1/2 miles of dead-end roads and the 7 miles of vehicle ways provide access throughout the WSA.

The study area currently receives very little primitive recreation use not associated with hunting.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in the WSA. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

The WSA currently produces 980 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually.

The economic value of existing outputs amounts to $7,389 annually and local personal income generated by existing outputs amounts to $8,173 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Table 4. Existing and Potential Livestock Use, Red Mountain WSA (OR-2-78)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Decrease in WSA (AUMs)
Trout Cr. Mtn. (No. 6015)	13,359	04/16-06-15	18	980	200

Effects on Wilderness Values

The **all wilderness alternative** would add 14,730 acres to the National Wilderness Preservation System (NWPS). It would protect the wilderness qualities of the area's features, including Red Mountain, the pronounced ridgeline which runs for two miles to the south, and the four intermittent drainages in the study area, Oreanna Creek, Red Mountain Creek, Dry Creek and No Name Creek.

Wilderness designation would maintain or improve the natural qualities of the area as well as the outstanding opportunities for solitude and primitive types of recreation. Closure of 7 miles of ways would improve the naturalness of the area by eliminating most vehicle use and allowing the ways to revegetate. Vehicles would continue to be used on the ways to maintain existing livestock facilities if there were no practical alternative to using vehicles, but such use would be limited. Vehicle way closures would also improve opportunities for solitude and improve the quality of primitive recreation by reducing motor vehicle use.

This alternative would also protect the special features of the study area, that is, crucial antelope and deer winter ranges, in their present condition. Precluding major developments within the WSA would maintain scenic values. Potential mineral development and range improvements may be totally or partially eliminated.

The **enhanced wilderness alternative** would add 15,850 acres to the NWPS, assuming the 680 acres of private inholding and adjacent split estate could be acquired and the 440 acres of public land outside the WSA were added. The consequences of this alternative are similar to the all wilderness alternative. However, the enhanced wilderness alternative would also prevent the possible development of split-estate and private lands within or adjacent to the WSA through acquisition of these lands.

Closing the three dead-end roads totaling 2 1/2 miles, along with vehicle ways, would improve the manageability of the WSA by preventing the possibility of vehicle intrusion on solitude. The closure would also improve the natural quality of the area by allowing the roads to revegetate and become less noticeable.

Under the **no wilderness/no action alternative**, wilderness values and the special features of the entire WSA would be subject to disturbance from any range and mineral developments.

Any surface disturbing activities such as mining could affect the natural character of the area. Depending on the location and extent of disturbance, primitive recreation could be adversely affected. Opportunities for solitude would be adversely affected as a result of any additional vehicle access and use.

Effects on Energy and Mineral Development

Areas designated as wilderness would be withdrawn from mineral exploration and development. Table 5 shows the acres that would be withdrawn under each alternative, including the acreages rated moderate for minerals.

Effects on Livestock Grazing

Inconclusive range survey data show that grazing could exceed the present carrying capacity in the Trout Creek allotment by approximately 6,500 AUMs (about 49 percent of the total licensed grazing use). Even if all of the proposed developments in the allotment were implemented, the additional forage gained in ten years would not be enough to offset the apparent excess livestock use. The preliminary estimate of the amount of apparent overgrazing is subject to refinement as the effects of future livestock grazing in the allotment are monitored. The proposed projects within the WSA would marginally contribute to alleviating this problem.

Table 5. Effects of Alternatives on Energy and Mineral Development, Red Mountain Wilderness Study Area (OR-2-78)

	Acres Withdrawn		
	All Wilderness	Enhanced Wilderness	No Wilderness/No Action (Preferred Alternative)
Total acres	14,730	15,170 [1]	0
Metals rated moderate	14,730	15,170	0
Diatomite rated moderate	5,692	6,132	0

[1] Includes the 440 acres of public land outside the WSA to be added under this alternative. Development would also be precluded on an additional 680 acres if private and split-estate land is acquired, as proposed under this alternative.

Under the **all and enhanced wilderness alternatives**, the proposed spring developments might or might not be allowed, depending on a site-specific assessment of whether they conform with Wilderness Management Policy. If not allowed, an opportunity to make available 200 AUMs from the spring development in the study area would be foregone, possibly resulting in a decrease of licensed use of up to 200 AUMs within the allotment.

The proposed spring developments have a benefit/cost ratio less than 1:1.

Under the enhanced wilderness alternative, the dead-end roads and ways would be closed, restricting motor vehicle use by the grazing operator to the outside boundary roads of the study area. This would not be inconvenient to the grazing operators, because the ways and dead-end roads are seldom used.

Under the **no wilderness/no action alternative**, the proposed developments would be installed to protect the spring areas and extend the spring flows later into the season, which would provide an additional 200 AUMs of available forage. Overall, licensed livestock AUMs in the allotment would not change.

Effects on Recreation Use

The quality of and opportunities for primitive recreation in the study area would be maintained or improved under the **all wilderness and enhanced wilderness alternatives**. Eliminating vehicle use on ways under the all wilderness alternative, and on the three dead-end roads under the enhanced wilderness alternative would improve the quality of primitive recreation.

The all wilderness alternative would reduce, and the enhanced wilderness alternative would eliminate, the light vehicle-oriented recreation use, such as hunting. The reduction in recreation use from loss of vehicle-oriented hunting may be offset by increased use from hunters who do not use vehicles within their hunting areas. Under the all wilderness alternative, the three dead-roads could still be used for access into the WSA by hunters.

Overall, existing use of the area for primitive recreation is limited. It is not expected that such use of the area would increase. Any increase in primitive recreation use would not be sufficient to offset the reductions in vehicle-oriented recreation. Therefore, net recreation use would be expected to decrease slightly under the all and enhanced wilderness alternatives.

Under the **no wilderness/no action alternative**, the current recreation use pattern would continue. Primitive recreation would remain subject to disturbance by vehicles. Vehicle use in this area would remain primarily oriented toward deer hunting. Primitive recreation would be further disturbed by range improvements or additional access associated with such developments.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 6 and 7. Table 6 shows the effects on economic value and table 7, the effects on local personal income. It is not known at this time whether individual proposed structural developments, such as the spring developments proposed for this WSA, would be constructed if the area were designated wilderness.

Currently, there is little dependence on vehicles for livestock management in the study area. The all wilderness and enhanced wilderness alternatives would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $125 per year.

The column for the wilderness alternatives shows the effects as a range of values dependent upon whether structural improvements and/or grazing operator access were allowed.

Table 6. Effects of Alternatives on Annual Economic Value, Red Mountain WSA (OR-2-78) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +200	+200
Adjustment [2]	AUM	-200	-200
Big game hunting [3]	RVD	0 to +10	+10
Upland game hunting [3]	RVD	0 to +3	+3
VALUE OF PLANNED INVESTMENTS [4]			
Grazing	$	0 to +1,508	+1,508
Big game hunting	$	0 to +227	+227
Upland game hunting	$	+94	+94
Total [5]	$	0 to +1,829	+1,829
Investments [6]	$	0 to -564	-564
Net Economic Value	$	0 to +1,265	+1,265
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS			
Grazing:			
Adjustment	$	-1,508	-1,508
Reduced access [7]	$	-125	0
Total	$	-1,633	-1,508
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS			
All categories [8]	$	-1,633 to -368 (-125)	-243 (0)

[1] Expected future increases due to range improvement investments.

[2] Adjustment for possible reduction in grazing is based on inconclusive data and may not be necessary.

[3] Expected future increases from proposed livestock projects.

[4] Structural projects involving up to $7,000 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[5] Detail may not sum to "Total" due to rounding.

[6] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[7] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

[8] See footnote 2. If the grazing adjustment is found to be unnecessary, compensating improvements would not be developed. Investments and grazing adjustments would be zero. The effects of this case are shown in parentheses.

Table 7. Effects of Alternatives on Local Personal Income, Red Mountain WSA (OR-2-78) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +200	+200
Adjustment [2]	AUM	-200	-200
Big game hunting [3]	RVD	0 to +10	+10
Upland game hunting [3]	RVD	0 to +3	+3
INCOME FROM PROPOSED INVESTMENTS [4]			
Grazing	$	0 to +1,674	+1,674
Big game hunting	$	0 to +99	+99
Upland game hunting	$	0 to +46	+46
Construction activity [5]	$	0 to +941	+941
Total [6]	$	0 to +1,819	+1,819
INCOME FROM OTHER EXPECTED OUTPUT CHANGES			
Grazing:			
Adjustment	$	-1,674	-1,674
INCOME FROM ALL OUTPUT CHANGES			
All categories [6] [7]	$	-1,674 to +145 (0)	+145 (0)

[1] Expected future increases due to range improvement investments.

[2] Adjustment for possible reduction in grazing is based on inconclusive data and may not be necessary.

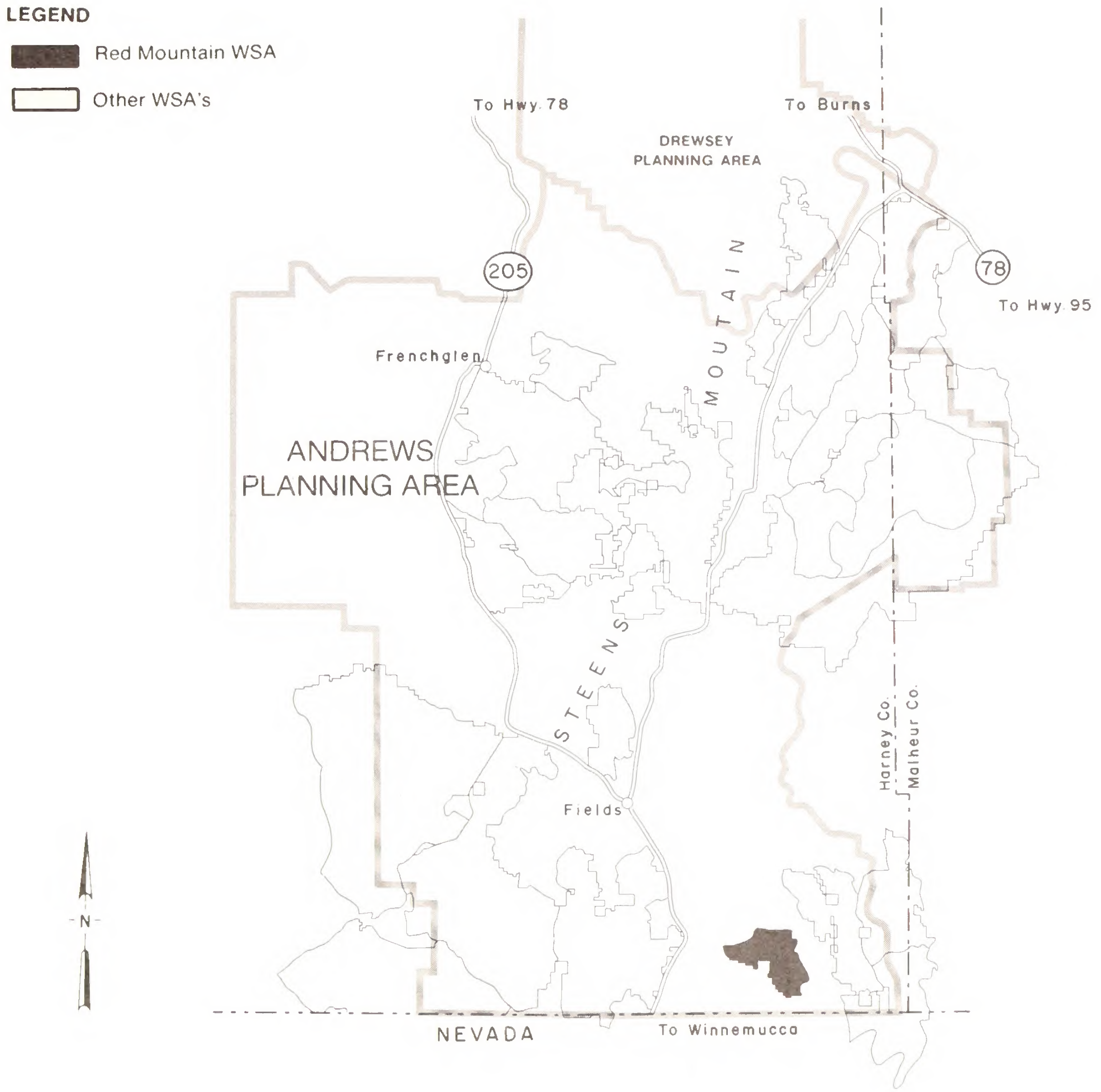
[3] Expected future increases from proposed livestock projects.

[4] Structural projects involving up to $7,000 total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[5] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[6] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 5.

[7] See footnote 2. If the grazing adjustment is found to be unnecessary, compensating improvements would not be developed. Investments and grazing adjustments would be zero. The effects of this case are shown in parentheses.



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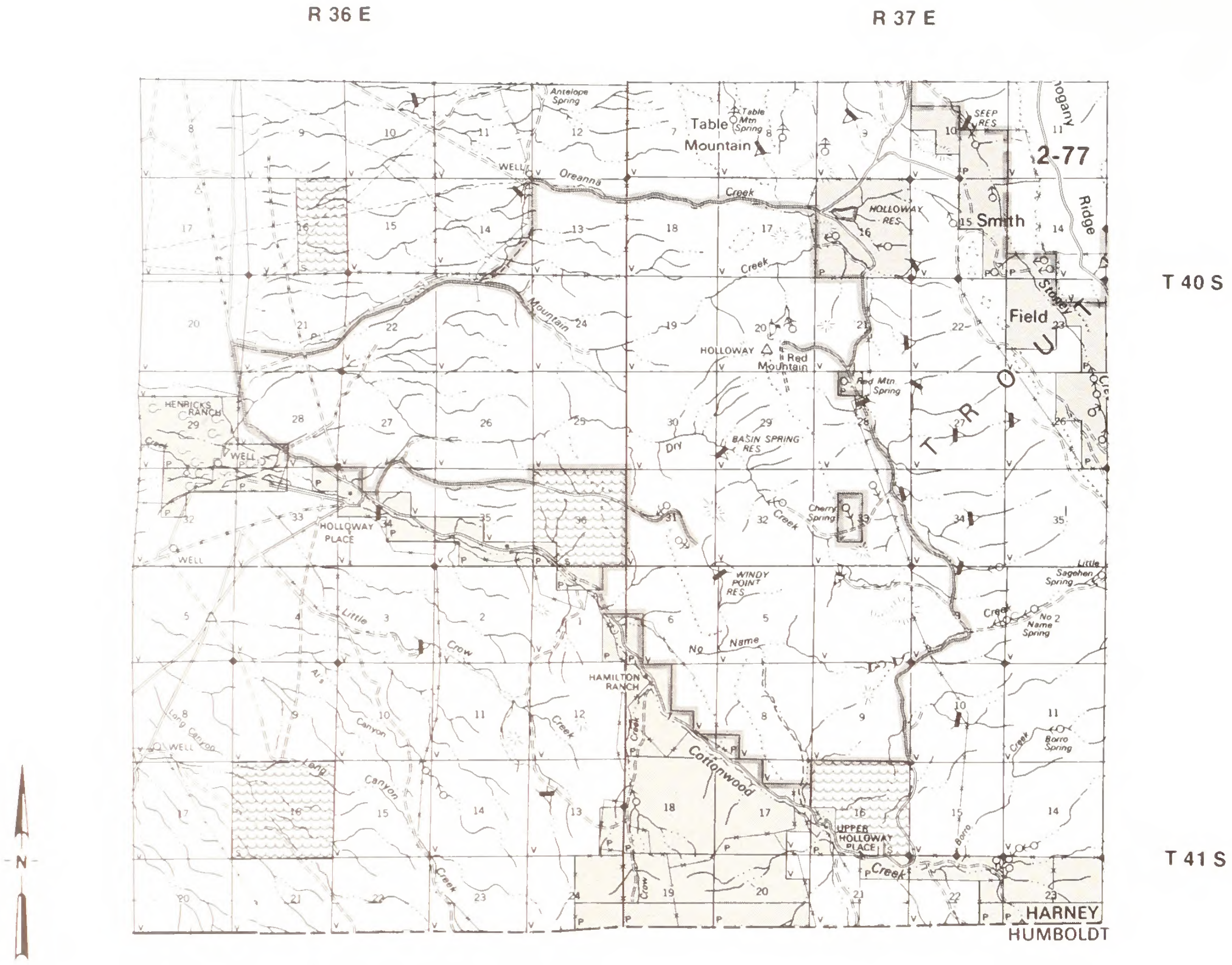
Burns District

Red Mountain WSA
OR-2-78

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

▬ ▬ Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

▨ Private

▨ BLM Surface-State or Private Subsurface (Split Estate)

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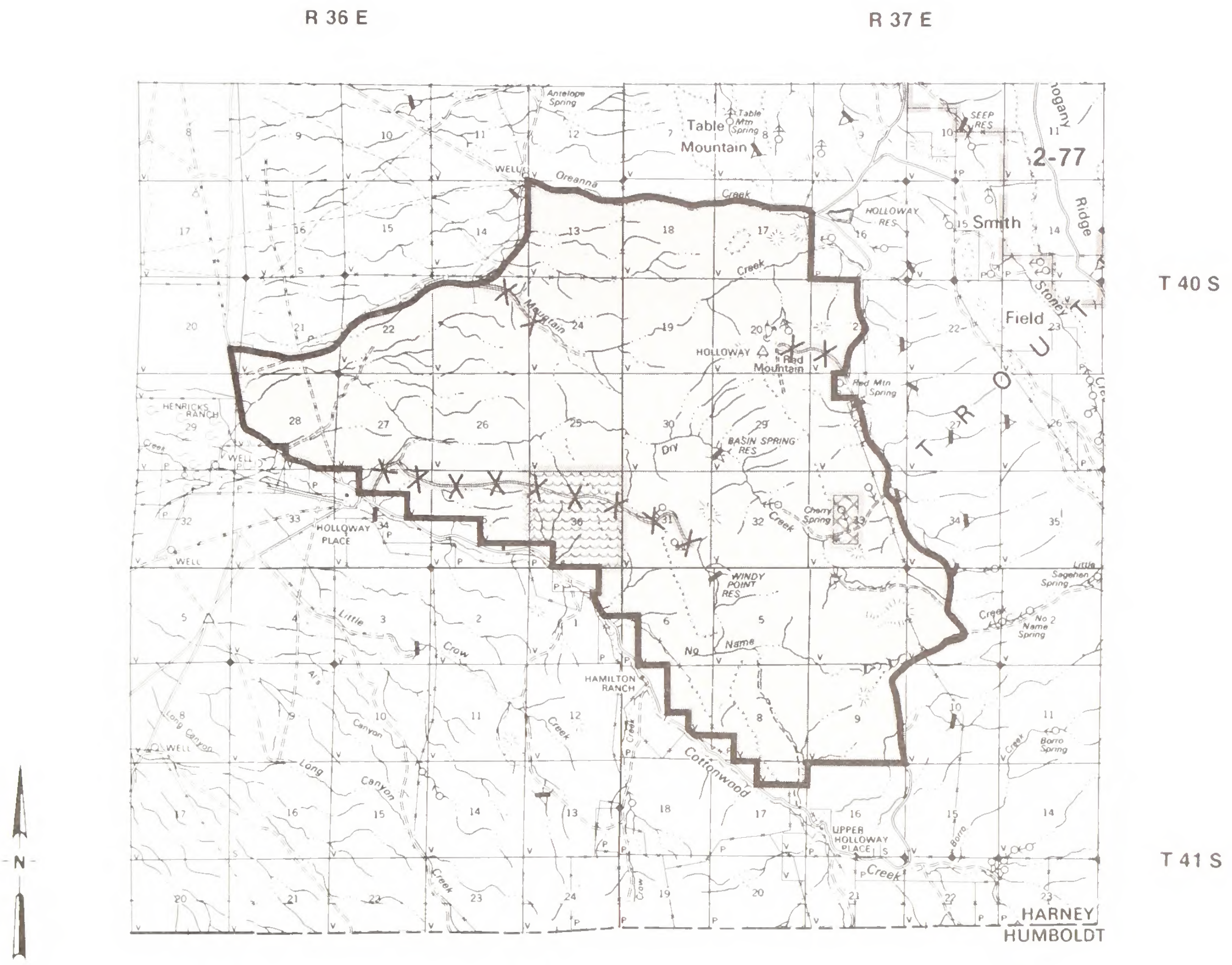
Red Mountain WSA
OR-2-78

LAND OWNERSHIP

MAP 2



LEGEND

▭ Wilderness Study Area Boundary

▭ Boundary of Adjacent Wilderness Study Areas

▭ Recommended Suitable for Wilderness

▨ Non-Federal Land within Recommended Wilderness

▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

X—X Recommended Road Closure

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Red Mountain WSA
OR-2-78

ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3

Although steep, the eastern slope of this ridgeline is much less rugged and rocky than the ridge to the west. The eastern slope gives way to foothills and lowlands along the eastern boundary as it merges with the Pueblo Valley. It is along the eastern boundary that the study area reaches its lowest elevation (at several points) of just under 4,200 feet.

A series of high valleys, basins and meadows lies between the two ridges.

Because of the elevation and exposure variations within the study area, there is a wide variety of vegetative types. Big sagebrush and low sagebrush (in the higher elevations) are the dominant vegetative species along with a variety of grasses. Mountain mahogany and aspen are found within the area at the higher elevations, while cottonwood and numerous riparian species occur along the drainages and near springs.

Interrelationships

The Pueblo Mountains WSA is adjacent to the Rincon WSA (OR-2-82) to the west. The two study areas are separated by a road, maintained primarily by BLM and serving recreationists, range users, private land owners, and BLM personnel.

The Pueblo-Lone Mountain grazing allotment embraces part of the Pueblo Mountains WSA, the adjacent Rincon WSA and two others, Basque Hills (OR-2-84) and Hawk Mountain (OR-1-146) WSAs. Proposals to construct range improvements in the Pueblo Mountains WSA are related to grazing management in the other three WSAs.

The Pueblo Foothills Research Natural Area (RNA) and Area of Environmental Concern (ACEC) is located entirely within the northeastern portion of the study area along the lower reaches of the Cottonwood Creek drainage (see map 2). The 2,520-acre area was designated to protect botanical values including seven plant species and a plant community unique to Oregon which includes narrowleaf cottonwood and Mormon tea. The RNA and ACEC designations protect this area for research and educational purposes.

Management of the Pueblo Foothills RNA/ACEC includes the following:

- minimizing surface disturbing activities detrimental to the plant communities and certain species;
- limiting vehicle use to the existing road;
- keeping fire out of the RNA;
- prohibiting introduction of exotic (non-native) plants and animals; and
- authorizing research and educational use by permit only.

Management restrictions for the RNA/ACEC would continue to apply whether or not the area is designated wilderness.

Winding through the central portion of the study area for 11 miles is the Pueblo Mountain segment of the Desert Trail. The trail has been marked and designated in the Pueblos through a cooperative venture between the Desert Trail Association (a private organization), the Parks and Recreation Division of the State of Oregon, and BLM. BLM and the Desert Trail Association have joined in a cooperative management agreement (CMA) to share responsibilities for maintaining this portion of the trail and developing other portions. The trail is part of the Oregon State Recreational Trails System.

The Oregon Department of Fish and Wildlife (ODFW) is monitoring California bighorn sheep in the Pueblo Mountain area. ODFW has also proposed an additional release of sheep in the area sometime before 1987 as part of a program to reintroduce bighorns into their former range. The Pueblos is one of six areas identified in the Burns District as a potential transplant site and ranks first on the Department's priority list.

The U.S. Soil Conservation Service has a snow survey marker located within the study area, which is checked periodically by aircraft during the winter to determine snow depths. (Snow surveys provide information on snow moisture content for water supply forecasts.) Snow measurements by aircraft would be allowed to continue in wilderness as an established practice. Any other means of snow measurement or maintenance of snow survey markers would have to be by primitive means, such as by horseback or on foot. (Impacts on snow measurement surveys are not discussed further in this appendix.)

Issues

Issues relating to each WSA were raised by BLM

and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- potential energy and mineral development, given the area's rated potential for metals and geothermal resources;

- proposed livestock improvements, including fences, reservoirs, pipelines, and seedings; and

- plant species of special interest within the area.

Also raised as an issue was the possibility of combining the Pueblo Mountains WSA with the adjacent Rincon WSA to form one large wilderness area.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- partial (preferred alternative)
- no wilderness/no action

Although identified as an issue, combining the Pueblo Mountains area with the Rincon WSA to the west by closing the road between them is not analyzed in the enhanced alternative. Such a merger would not be feasible, because the road which separates the two study areas, commonly referred to as the Domingo Pass or Oregon End road, provides access for livestock operators, recreationists, BLM personnel, and private land owners. Also, combining the two study areas would not enhance the manageability or wilderness qualities of either WSA.

All Wilderness

The all wilderness alternative would recommend all 69,310 acres of public land in the Pueblo Mountains WSA (including 600 acres in Nevada) suitable for wilderness (see map 2). For purposes of analysis, it is assumed the split-estate inholdings in the study area would not be acquired. The 12 dead-end roads in the study area would remain open.

Enhanced Wilderness

The enhanced wilderness alternative would recommend as suitable for wilderness 65,230 acres of public land in the WSA (including 600 acres in Nevada) and 4,785 acres of public land outside the WSA boundary (see map 3). Total public land recommended suitable would be 70,015 acres. Most of the land that would be added from outside the WSA is on the northern end of the study area, but acreage would also be added on the northeast, northwest and southwest. Some 4,080 acres of the WSA along the eastern and southern boundary would be recommended nonsuitable.

Also, an attempt would be made to acquire 3,910 acres of private land and 4,315 acres of split-estate land both within and adjacent to the study area boundary. This acreage could be acquired through purchase or exchange with willing owners.

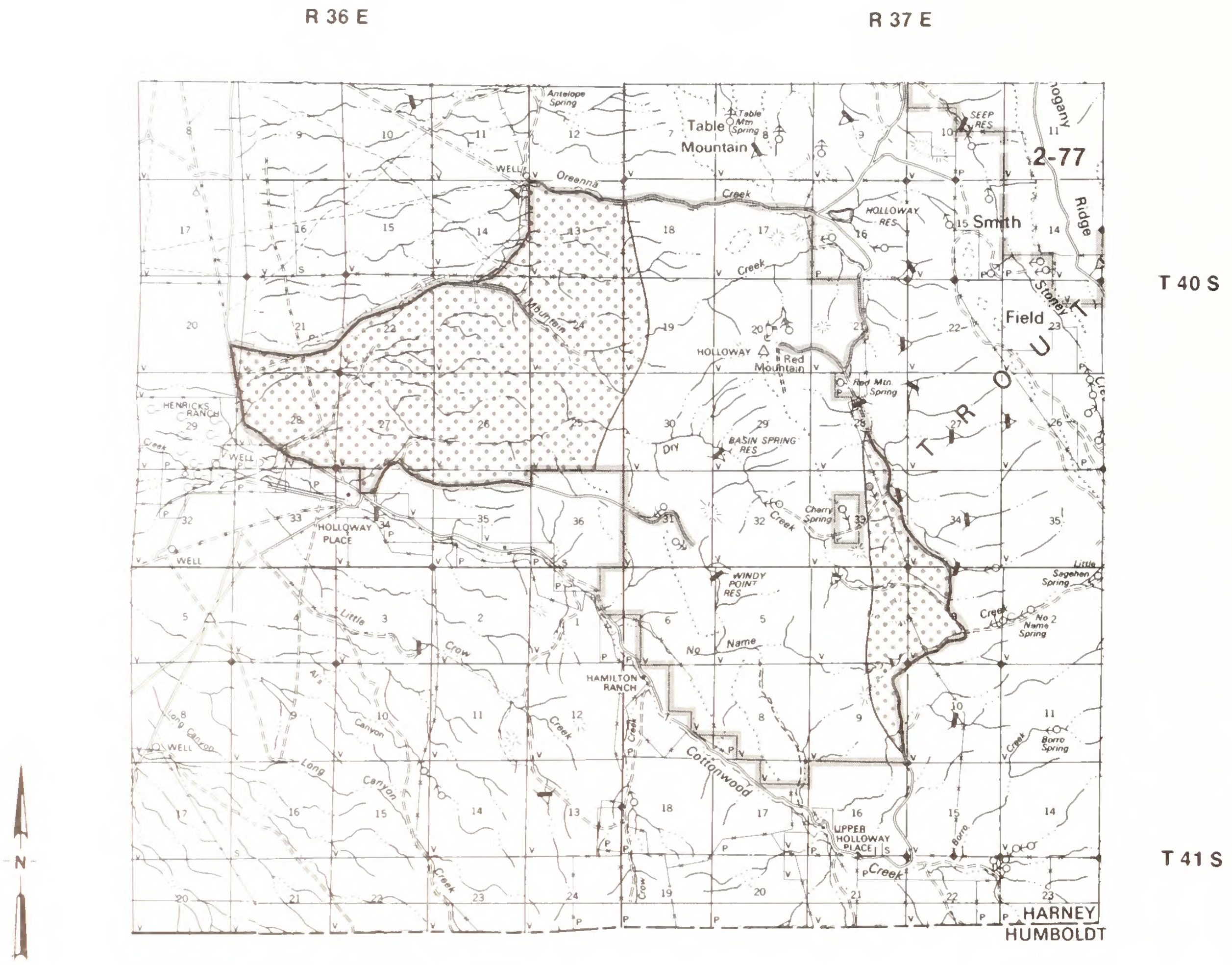
Assuming acquisition of these parcels, total area recommended suitable under this alternative would be 78,240 acres.

Eleven dead-end roads which enter the study area from various points around the perimeter and a portion of another road which forms part of the northern boundary would be closed.

The boundary under this alternative would generally follow the Domingo Pass-Oregon End road on the north and west, except in the southwestern and northeastern corners. On the southwest, the boundary would skirt a small amount of private land and then run parallel to a small powerline.

On the northeast, the boundary would make a jog south of the Domingo Pass road following a contour line and then joining the original northeastern boundary. This would avoid a road and signs of mineral prospecting which detract from the naturalness of the area and which were excluded from the study area during the inventory. The southern boundary would follow the existing WSA boundary while the eastern boundary would be adjusted slightly to conform with contour lines and legal subdivisions on the south and the county road on the north.

The enhanced wilderness alternative would improve the manageability of Pueblo Mountains WSA by eliminating vehicles on the dead-end roads within the area, and by eliminating the potential for development of and the need for access to the



▨ **Medium Potential (3C) for Diatomite**

Entire WSA:
Medium Potential
(3B) for Mercury

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Burns Districts

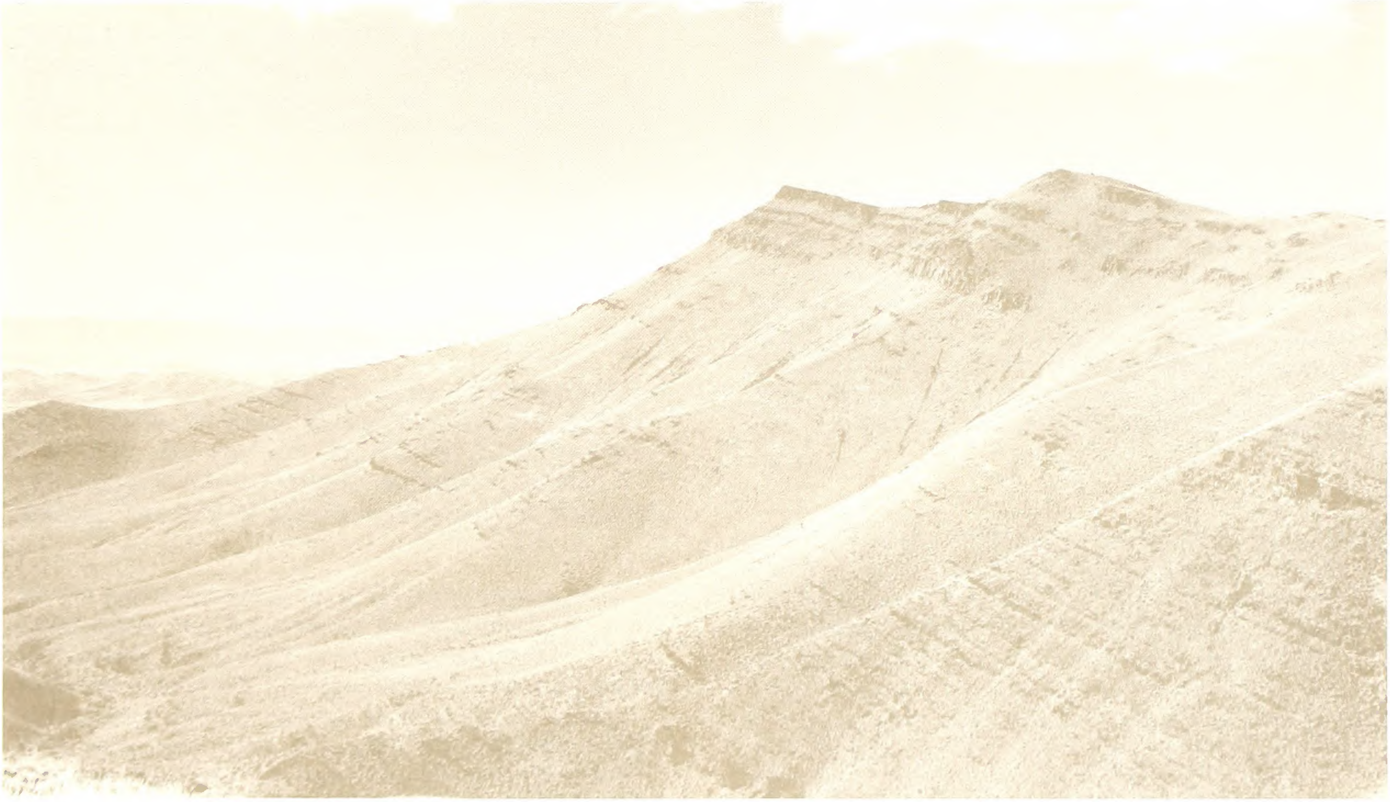
Red Mountain WSA
OR-2-78

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4

Red Mountain WSA, OR-2-78. The west central portion of the study area looking northeast up Red Mountain Creek with Red Mountain on the right. Within the area recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. The rolling terrain in this photo becomes less pronounced to the west. Date unknown.



Red Mountain WSA, OR-2-78. Looking north from a ridgeline just south of Dry Creek showing the steep western slope of Red Mountain (the highest point in the study area). The drainage in the immediate foreground is Dry Creek. Within the area recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. August 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Pueblo Mountains Wilderness Study Area

(OR-2-81/NV-020-642)

General Description of the Study Area

The Pueblo Mountains wilderness study area is located 96 miles south of Burns and five miles south of Fields, Oregon (see map 1). Almost all of the area is within Harney County although a small portion crosses the state line into Humboldt County, Nevada. The entire study area lies to the west of the main north-south county road which runs between Fields and Denio, Nevada. The nearest major highway is Nevada State Highway 140, four miles to the south of the WSA.

The WSA is an irregularly shaped area containing 69,310 acres of public land (600 acres in Nevada). The WSA also contains 1,920 acres of split-estate inholdings in three 640-acre parcels scattered through the central portion of the area (see map 2).

At the extremes the area is 15 miles long and 11 miles wide. The boundaries are formed by a combination of private and split-estate land (federally managed surface, state or privately owned subsurface mineral rights), BLM roads, a county road (east side only), and legal subdivisions. Legal subdivisions form the boundary where portions of the inventory unit were excluded from further wilderness review because they lacked wilderness characteristics.

In addition, 12 dead-end roads (totaling 17 miles) enter the study area from various points around the perimeter and also form part of the boundary. One of the roads ends at a 320-acre parcel of private property, making the parcel a part of the boundary even though it is surrounded by the wilderness study area.

The most prominent physical feature of the study area is the Pueblo Mountains ridgeline which runs north and south along the entire length of the western half of the WSA. This is a tilted fault block mountain range whose eastern side has been uplifted along a north-south trending fault. Averaging 7,300 feet in elevation along the crest, the eastern face of this ridge is steep, rugged, and rocky while much of the western slope is like a table top tilted to the west at nearly a 45-degree angle.

Less than three miles from the western ridge lies a shorter (9-mile-long) north-south ridgeline. Along this ridgeline is Pueblo Mountain. At 8,634 feet, it is the second highest peak in southeastern Oregon and the highest point in the study area. Of the major drainages originating in the central portion of the study area, Willow and Cottonwood Creeks skirt this ridgeline to the north while both Arizona and Van Horn Creeks cut through the ridge within rugged canyons. Denio Creek also cuts through the ridge, just outside the study area to the south.

Although steep, the eastern slope of this ridgeline is much less rugged and rocky than the ridge to the west. The eastern slope gives way to foothills and lowlands along the eastern boundary as it merges with the Pueblo Valley. It is along the eastern boundary that the study area reaches its lowest elevation (at several points) of just under 4,200 feet.

A series of high valleys, basins and meadows lies between the two ridges.

Because of the elevation and exposure variations within the study area, there is a wide variety of vegetative types. Big sagebrush and low sagebrush (in the higher elevations) are the dominant vegetative species along with a variety of grasses. Mountain mahogany and aspen are found within the area at the higher elevations, while cottonwood and numerous riparian species occur along the drainages and near springs.

Interrelationships

The Pueblo Mountains WSA is adjacent to the Rincon WSA (OR-2-82) to the west. The two study areas are separated by a road, maintained primarily by BLM and serving recreationists, range users, private land owners, and BLM personnel.

The Pueblo-Lone Mountain grazing allotment embraces part of the Pueblo Mountains WSA, the adjacent Rincon WSA and two others, Basque Hills (OR-2-84) and Hawk Mountain (OR-1-146) WSAs. Proposals to construct range improvements in the Pueblo Mountains WSA are related to grazing management in the other three WSAs.

The Pueblo Foothills Research Natural Area (RNA) and Area of Environmental Concern (ACEC) is located entirely within the northeastern portion of the study area along the lower reaches of the Cottonwood Creek drainage (see map 2). The 2,520-acre area was designated to protect botanical values including seven plant species and a plant community unique to Oregon which includes narrowleaf cottonwood and Mormon tea. The RNA and ACEC designations protect this area for research and educational purposes.

Management of the Pueblo Foothills RNA/ACEC includes the following:

- minimizing surface disturbing activities detrimental to the plant communities and certain species;

- limiting vehicle use to the existing road;

- keeping fire out of the RNA;

- prohibiting introduction of exotic (non-native) plants and animals; and

- authorizing research and educational use by permit only.

Management restrictions for the RNA/ACEC would continue to apply whether or not the area is designated wilderness.

Winding through the central portion of the study area for 11 miles is the Pueblo Mountain segment of the Desert Trail. The trail has been marked and designated in the Pueblos through a cooperative venture between the Desert Trail Association (a private organization), the Parks and Recreation Division of the State of Oregon, and BLM. BLM and the Desert Trail Association have joined in a cooperative management agreement (CMA) to share responsibilities for maintaining this portion of the trail and developing other portions. The trail is part of the Oregon State Recreational Trails System.

The Oregon Department of Fish and Wildlife (ODFW) is monitoring California bighorn sheep in the Pueblo Mountain area. ODFW has also proposed an additional release of sheep in the area sometime before 1987 as part of a program to reintroduce bighorns into their former range. The Pueblos is one of six areas identified in the Burns District as a potential transplant site and ranks first on the Department's priority list.

The U.S. Soil Conservation Service has a snow survey marker located within the study area, which is checked periodically by aircraft during the winter to determine snow depths. (Snow surveys provide information on snow moisture content for water supply forecasts.) Snow measurements by aircraft would be allowed to continue in wilderness as an established practice. Any other means of snow measurement or maintenance of snow survey markers would have to be by primitive means, such as by horseback or on foot. (Impacts on snow measurement surveys are not discussed further in this appendix.)

Issues

Issues relating to each WSA were raised by BLM

and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- potential energy and mineral development, given the area's rated potential for metals and geothermal resources;
- proposed livestock improvements, including fences, reservoirs, pipelines, and seedings; and
- plant species of special interest within the area.

Also raised as an issue was the possibility of combining the Pueblo Mountains WSA with the adjacent Rincon WSA to form one large wilderness area.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- partial (preferred alternative)
- no wilderness/no action

Although identified as an issue, combining the Pueblo Mountains area with the Rincon WSA to the west by closing the road between them is not analyzed in the enhanced alternative. Such a merger would not be feasible, because the road which separates the two study areas, commonly referred to as the Domingo Pass or Oregon End road, provides access for livestock operators, recreationists, BLM personnel, and private land owners. Also, combining the two study areas would not enhance the manageability or wilderness qualities of either WSA.

All Wilderness

The all wilderness alternative would recommend all 69,310 acres of public land in the Pueblo Mountains WSA (including 600 acres in Nevada) suitable for wilderness (see map 2). For purposes of analysis, it is assumed the split-estate inholdings in the study area would not be acquired. The 12 dead-end roads in the study area would remain open.

Enhanced Wilderness

The enhanced wilderness alternative would recommend as suitable for wilderness 65,230 acres of public land in the WSA (including 600 acres in Nevada) and 4,785 acres of public land outside the WSA boundary (see map 3). Total public land recommended suitable would be 70,015 acres. Most of the land that would be added from outside the WSA is on the northern end of the study area, but acreage would also be added on the northeast, northwest and southwest. Some 4,080 acres of the WSA along the eastern and southern boundary would be recommended nonsuitable.

Also, an attempt would be made to acquire 3,910 acres of private land and 4,315 acres of split-estate land both within and adjacent to the study area boundary. This acreage could be acquired through purchase or exchange with willing owners.

Assuming acquisition of these parcels, total area recommended suitable under this alternative would be 78,240 acres.

Eleven dead-end roads which enter the study area from various points around the perimeter and a portion of another road which forms part of the northern boundary would be closed.

The boundary under this alternative would generally follow the Domingo Pass-Oregon End road on the north and west, except in the southwestern and northeastern corners. On the southwest, the boundary would skirt a small amount of private land and then run parallel to a small powerline.

On the northeast, the boundary would make a jog south of the Domingo Pass road following a contour line and then joining the original northeastern boundary. This would avoid a road and signs of mineral prospecting which detract from the naturalness of the area and which were excluded from the study area during the inventory. The southern boundary would follow the existing WSA boundary while the eastern boundary would be adjusted slightly to conform with contour lines and legal subdivisions on the south and the county road on the north.

The enhanced wilderness alternative would improve the manageability of Pueblo Mountains WSA by eliminating vehicles on the dead-end roads within the area, and by eliminating the potential for development of and the need for access to the split-estate and private inholdings. This alternative would enhance manageability of the wilderness by eliminating a relatively small amount of land on the eastern side of the WSA and establishing the boundary along a contour which could be more readily identified. It would also avoid some small amounts of private land and several mining claims. Lands along the southern and eastern boundary would be recommended nonsuitable for wilderness in this alternative because of manageability problems.

Partial (Preferred Alternative)

The partial alternative would recommend 38,875 acres of public land (including 600 acres in Nevada) suitable for wilderness designation (see map 4). In addition, an attempt would be made to acquire 1,930 acres of private land and 2,440 acres of split-estate land within and adjacent to the WSA. Portions of seven dead-end roads, totaling about five miles, would be closed under this alternative.

Assuming acquisitions of the private and split-estate parcels, total area recommended suitable under this alternative would be 43,245 acres. Some 30,435 acres would be recommended nonsuitable.

Major changes in the boundary would occur along the eastern and western sides of the WSA. On the west, the boundary would follow an elevation contour near the toe of the western ridge at the 5,200-foot level. An area of 9,900 acres covering the lower foothills on this side of the WSA would be recommended nonsuitable for wilderness in order to eliminate conflicts with proposed range improvements.

On the northeastern side, the boundary would follow a road which crosses private land at the base of the east side of the western ridge. Part of the private land recommended for acquisition is along this part of the boundary. Using the road as the boundary would improve the manageability of the area by providing a more recognizable boundary than the legal subdivisions of the private land.

The remainder of the eastern boundary would follow the crest of the eastern ridgeline except for a 1.5-mile stretch along Cottonwood Creek. Placing the boundary along the summit of the ridge would avoid conflicts with existing and potential mineral developments in an area identified as having high favorability for metals and moderate favorability for the occurrence of geothermal resources, and screen any potential mineral development on the east side of the WSA from view in the rest of the study area.

Not all of the area with high favorability for the occurrence of metals would be excluded under this alternative. The entire eastern two-thirds of the WSA, from the crest of the western ridgeline to the eastern boundary, has been classified as having high metallic mineral potential. Most of this same area also has very high wilderness values. An alternative designed to exclude all of the area with high mineral potential would leave only the summit and part of the western slope of the western ridge. This would be a difficult area to manage as wilderness because the area east of the ridge (the central portion of the study area), which is quite visible from the top of the ridge, would be open to mining and subject to surface disturbance.

The area recommended as nonsuitable on the eastern side of the WSA covers 20,535 acres.

Land uses expected within portions of the WSA not recommended as suitable would be the same as those for the no wilderness/no action alternative, including continued use of the area for livestock grazing, development of range improvements for grazing, and possible additional mineral exploration and development. While all of the area recommended as nonsuitable for wilderness is currently used for livestock grazing, the new range improvements would primarily be located along the western boundary while energy and mineral development would be expected to occur along the entire eastern side where there are existing mining developments and a high favorability for occurrence of metals.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features, in addition to the ACEC constraints, relevant to this analysis:

- implementation of proposed livestock improvement projects, including brush control, fencing, cattleguard and water projects;

- continued availability for mineral exploration and development; and

- continued use of motor vehicles for livestock management and recreation.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The areas recommended as suitable would be manageable as wilderness under all of the wilderness alternatives. Some manageability problems could occur under the all wilderness alternative due to the private and split-estate inholdings, two boundary parcels of private land, and dead-end roads.

Table 1. Summary of Proposed Management Under Each Alternative, Pueblo Mountains WSA (OR-2-81)

Proposed Management	All Wilderness	Enhanced	Partial Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness [1]	69,310	70,015	38,875	0
Acres Closed to ORVs by Wilderness Designation	69,310	70,015	38,875	0
Miles of Roads Closed	0	17	5	0
Miles of Ways Closed	32	32	24	0
Acres of Full Fee Estate Acquired [2]	0	3,910	1,930	0
Acres of Split Estate Acquired [2]	0	4,315	2,440	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	69,310	70,015	38,875	0
Structural Wildlife Projects Developed: Stream Channel Projects (number) [3]	0-2	0-2	0-2	2
Structural Livestock Projects Developed:				
Reservoirs & Waterholes (number)	0-3	0-3	0-3	3
Springs (number) [4]	1-2	0-2	2	2
Pipelines (miles) [5]	0	0	5	5
Fences (miles)	0-34	0-34	27-34	34
Storage Tanks (number)[5]	0	0	1	1
Vegetative Manipulation for Livestock: Brush Control with Seeding (acres)	0	0	5,420	5,420

[1] Suitable acreage includes Nevada's Pueblo Mountains WSA (NV-020-642) totaling 600 acres under the all wilderness, enhanced wilderness, and partial alternatives.

[2] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

[3] One project each on two streams with ten stream structures proposed per stream.

[4] Includes a spring development proposed on adjacent BLM lands incorporated into the suitable recommendation under the enhanced wilderness alternative.

[5] The proposed projects are associated with the seeding and would not be proposed without the seeding.

The problems would be associated with possible development of mineral resources on the split-estate or private lands, or other uses of the private lands, and the need for continued or additional access. At this time there is no development planned for any of these parcels. However, all of the private land and most of the split-estate land is within the area of high favorability for metals.

Boundary location and identification under the all wilderness alternative would also present some manageability problems. This is especially true in the north-central portion of the WSA where adjacent private land forms a large part of the boundary. Also, on the eastern side of the WSA, private land and past mineral development activities are adjacent to the boundary. Minor boundary adjustments would improve the manageability of the area by avoiding the private lands.

There are no manageability problems expected under the enhanced wilderness alternative or the partial alternative (preferred). Acquisition of private and split-estate lands and road closures would eliminate the manageability problems of the all wilderness alternative.

Rationale for the Selection of the Preferred Alternative

The partial alternative is preferred for a number of reasons. The area recommended as suitable for wilderness designation is basically the core of the study area. The suitable area includes high mountain ridges, peaks (including the second highest in southeastern Oregon), meadows, and drainage basins, with a variety of vegetation, scenery, and geologic and topographic features.

This area has many wilderness qualities including a basically natural appearance, outstanding opportunities for solitude, and a variety of primitive types of recreation. This portion of the WSA has special wilderness features which include habitat for a resident population of bighorn sheep, interesting geologic features, scenic values, and a number of plant species of special interest.

The size of the partial (preferred) alternative has been adjusted since the preparation of BLM's

Table 2. Summary of Environmental Consequences of Alternatives, Pueblo Mountains WSA (OR-2-8)

Resource or Activity	All Wilderness	Enhanced Wilderness	Partial (Preferred Alternative)	No Wilderness/No Action
Wilderness Values	Would add 69,310 acres to the NWPS. Preserves the area's wilderness characteristics and special features, including two prominent ridgelines and the second highest peak in southeastern Oregon, a resident population of bighorn sheep, several plant species of special interest, a unique plant community and some highly scenic terrain. Closure of 32 miles of ways would enhance wilderness values. If valuable mineral discoveries were made on mining claims before designation and mineral development occurred, or if mineral development occurred on inholdings, wilderness values would be impaired. The WSA is generally manageable under this alternative with some manageability problems.	Would add 78,240 acres to the NWPS, including the 4,785 acres of public land outside the WSA, and assuming 8,225 acres of private split-estate land could be acquired. Preserves the features identified in the all wilderness alternative. Improves the wilderness qualities and manageability of the area by recommending the closure of dead-end roads and the acquisition of inholdings and boundary parcels. Recommends as nonsuitable for wilderness 4,080 acres to improve boundary identification and to avoid potential manageability problems with mineral development. Mineral development in area recommended as nonsuitable could impair wilderness values in that area.	Would add 43,245 acres to the NWPS, assuming 4,370 acres of private and split-estate land could be acquired. Preserves wilderness characteristics and special features of central portion of study area containing two prominent ridgelines and basins and meadows between them. Manageable as wilderness. Road closures and land acquisitions also recommended as part of this alternative. Some 30,435 acres recommended nonsuitable for wilderness. Mineral and range developments would impair wilderness values in areas recommended nonsuitable for wilderness, which include a unique vegetative community and some crucial wildlife habitat.	Wilderness values and special features would be subject to disturbance from brush control and the seeding of crested wheatgrass on the west, and potential mineral developments within the eastern two thirds of the area.
Energy and Mineral Development	Development precluded on 69,310 acres, including 39,240 acres with high potential for gold, copper, mercury, silver, and molybdenum, 17,870 acres with moderate potential for geothermal energy, and 18,640 acres of a nominated Area of Critical Mineral Potential (ACMP) on the northern end of the study area.	Development precluded on 70,015 acres including 4,785 acres public land outside WSA, plus an additional 8,225 acres if acquired. Includes 38,680 acres with high potential for metals, 9,900 acres with moderate potential for geothermal, and 21,520 acres of a nominated ACMP.	Development precluded on 38,875 acres, plus an additional 4,370 acres if acquired. Includes 16,800 acres with high potential for metals, 2,560 acres with moderate potential for geothermal energy and 8,640 acres of the nominated ACMP.	No impact.
Vegetation	Vegetation preserved.	Same as all wilderness in suitable area.	Vegetation preserved in suitable area. Vegetation diversity in nonsuitable area would be reduced by brush control and seeding on 5,240 acres. ONHP plant species of special interest subject to disturbance unless designated BLM-sensitive species.	Same as nonsuitable area in partial alternative.
Wildlife	Wildlife habitat preserved. Proposed brush control and seeding to enhance livestock grazing would be precluded and opportunity to increase antelope numbers by 50 head would be foregone. Stream channel projects benefitting Whitehorse cutthroat trout might or might not be allowed.	Same as all wilderness.	Wildlife habitat preserved in suitable area. Seeding proposed for western side of WSA would be implemented, resulting in increase of 50 antelope. Other wildlife populations would not change significantly. Stream channel projects benefitting Whitehorse cutthroat trout might or might not be allowed.	Seeding would increase antelope population by 50. Other wildlife population not likely to be affected. Stream channel projects would be implemented.
Livestock Grazing	Proposed brush control and seedings and some structural projects would not be allowed. Remainder of structural projects might be foregone. Additional forage could be foregone, which could reduce licensed use in allotment by up to 160 AUMs. Closure of ways would not be a substantial inconvenience to operator.	Same as all wilderness, except that additonal forage would be foregone, which could reduce licensed use in the allotment by up to 167 AUMs. Closure of dead-end roads would make salt distribution inconvenient for operator.	Same as all wilderness alternative, except that proposed brush control and seeding project would be allowed, as well as most structural projects as they are in the area recommended nonsuitable. Additional forage would be foregone, which could reduce licensed use in the allotment by up to 14 AUMs. Closure of roads would not be a problem for operator under this alternative.	All proposed range improvements would be permitted, which would produce forage which would contribute 160 AUMs toward forestalling a possible 4,000 AUM decrease allotment wide.
Recreation Use	Primitive recreation opportunities would be preserved. Use of motor vehicles for recreation would be restricted to dead-end roads. This might result in some reduction of total recreation use as a result of prohibiting vehicle use of ways.	Vehicle-oriented recreation would be eliminated, probably resulting in a net reduction in recreation use. Some of this might be made up from shifts in the patterns of hunting use and increased primitive	Probably no significant change in recreation use with perhaps some increase in total use. Vehicle use allowed in area recommended as nonsuitable. Primitive recreation would be subject to disturbances from other types of uses or activities in non-	Existing vehicle-oriented recreation activities would continue. Primitive recreation uses would be subject to disturbances from other resource uses of the WSA. Possible

Table 2. (continued)

Resource or Activity	All Wilderness	Enhanced Wilderness	Partial (Preferred Alternative)	No Wilderness/No Action
	The reduction would not be substantial. Possible slight increases in recreation use from implementation of some livestock projects which would increase wildlife populations.	recreation due to the presence of the High Desert Trail and the attractiveness of the WSA. Possible slight increases in recreation use from implementation of some livestock projects which would increase wildlife populations.	suitable portion of WSA. Possible increases in recreation use from implementation of livestock projects which would increase wildlife populations.	increases in recreation from implementation of livestock projects which would increase wildlife populations.
Economic Value and Local Income	Decrease in annual economic value could range from $32,714 to $31,176, depending on what proposed projects would be allowed in wilderness. Decrease in local personal income of $10,364 to $8,285, depending on the same uncertain factors. Both sets of figures exclude unknown economic effects of mineral development and unquantified changes in recreation use.	Decrease in annual economic value could range from $37,925 to $35,853, depending on what proposed projects would be allowed in wilderness. Decrease in local personal income of $11,452 to $9,340, depending on the same uncertain factors. Both sets of figures exclude unknown economic effects of mineral development and unquantified change in recreation use. The maximum increase in transportation costs to ranchers with grazing permits would be $1,209.	Decrease in annual economic value could range from $40,635 to $39,922, depending on what proposed projects would be allowed in wilderness. Decrease in local personal income of $6,892 to $6,066, depending on the same uncertain factors. Both sets of figures exclude unknown economic effects of mineral development and unquantified changes in recreation use.	Decrease in economic value by $13,185 and and increase in local personal income by $2,201 from construction of proposed projects.

management framework plan (MFP). The adjustment was made because of additional mineral information which was made available after the preparation of the MFP. The new mineral information showed the area has a higher mineral potential than previously thought. The resulting boundary adjustment to the partial (preferred) alternative was an effort to preserve both wilderness values and opportunities for mineral development.

Wilderness designation within this portion of the study area would protect and maintain the area's wilderness values and special features within an area which is capable of being managed to preserve these qualities.

The primary conflict in the portion of the study area recommended suitable is the potential for minerals. More than half of the area recommended suitable has high favorability for the occurrence of metals. Although this is a major conflict, wilderness values associated with the central portion of the Pueblo Mountains WSA outweigh the potential benefits to be gained from mineral resource development.

Portions of the study area are recommended as nonsuitable for wilderness under this alternative to resolve conflicts with other resource uses, including development of new range improvements for livestock grazing and the potential for mineral development. The proposed livestock range improvements occur along the study area's western boundary and include crested wheatgrass seedings and reservoirs. These developments would provide additional livestock forage and allow for the redistribution of livestock use.

This alternative would recommend the eastern side of the WSA nonsuitable because of energy and mineral potential. This portion of the WSA has moderate favorability for the occurrence of geothermal resources and high favorability for metals. This alternative attempts to resolve the potential conflict between mineral resource development and wilderness protection by locating the boundary to effectively screen the wilderness area from the area of potential development.

Affected Environment

This section discusses only those activities or resources which influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Pueblo Mountains WSA is in a natural condition. The man-made developments of the WSA are not substantially noticeable within the study area as a whole. Because the steep topography of much of the WSA precludes development in many locations and because the diversity of the landscape screens many of the developments, the influence of the man-made developments on the natural quality of the study area is slight.

These man-made features within the study area include five reservoirs, four developed springs, one water tank, three fences totaling one mile, 32 miles of vehicle ways, 15 areas of past mining activity, one powerline totaling four miles, four ditches totaling four miles, one cemetery, and two dump areas. Generally, the developments are scattered, screened by the topography, and can be seen from only small, localized areas. Approximately 4 percent of the study area is influenced by these features. (The area of influence is an estimate of the acreage within the WSA from which these developments can be seen.)

The reservoirs, developed springs, and ditches are each visible from only small areas. The ditches, should they be maintained in the future, would be more noticeable, but at this time there is no plan for their improvement. The water tank is silver colored and quite visible but could be painted a darker color. The mining scars are localized and often screened by the topography, so they are visible only from the immediate vicinity.

The powerline runs adjacent to the county highway (the eastern boundary road) in the lowlands. This development is visible only from a small area near the highway. The cemetery lies close to the county road and is not a substantial visual disturbance. The vehicle ways are generally located in drainages where they are seen only from small areas. In addition many of the ways are overgrown and barely visible.

Developments outside the study area do little to detract from the natural character of the WSA. Outside developments which influence the study area are boundary roads (including the 12 dead-end roads which penetrate the WSA), fences, powerlines and ranches. Most of these features are visible only from points around the perimeter of the area and are not an overwhelming influence on the landscape. Those developments which are occasionally visible from the higher elevations are distant and unobtrusive.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Pueblo Mountains WSA has outstanding opportunities for solitude due to the large size, configuration and topography of the area. The Pueblos' diverse landscape includes rugged ridges with steep escarpments, high-elevation basins and meadows, and deeply cut drainages. All of these physical features enhance the opportunities for solitude within the area and provide numerous settings for a visitor to find seclusion.

Vegetative screening, sufficient to enhance solitude, is limited to portions of the drainages, meadows, and spring areas. Vegetation such as aspen, cottonwood, alder, willow, and chokecherry provide some screening in the wetter locations, while mountain mahogany occurring in the higher meadows and east facing slopes in the central part of the WSA also provides some screening.

Outstanding opportunities for primitive and unconfined types of recreation in the Pueblo Mountains WSA include day hiking, backpacking, hunting, horseback riding, sightseeing, wildlife viewing and photography. The high quality of these activities is largely due to the abundance and attractiveness of the area's physical features.

The drainages and steep slopes around the perimeter of the WSA provide the best opportunities for day hikes. The drainages (primarily those on the eastern side) also provide access to the interior of the study area for longer backpacking and horseback riding trips. Opportunities for sightseeing and photography can be found throughout the WSA and range from vast distant views from the summit of Pueblo Peak and the western ridge to more localized viewing of waterfalls in the upper reaches of Cottonwood Creek and the numerous wildflowers.

Opportunities for hunting and viewing wildlife are also available within the study area. Mule deer and upland game birds (chukar, quail, and dove) are the most commonly hunted species, while numerous nongame types of wildlife are frequently visible throughout the area.

Special Features

The Pueblo Mountains WSA contains several special features which contribute to the value of the area as wilderness. These include distinctive geological, botanical, wildlife and scenic qualities.

Geological features include the enormous westward-tilted fault block, of which the Pueblo Mountains form the southern part. This is an impressive example of the basin-and-range type of structure which covers much of Nevada. It is characterized by a series of parallel fault blocks forming elongated mountain ranges and broad, intervening valleys. The Steens-Pueblo fault block represents the northernmost extension of this type of structure.

Another interesting geological feature is the pre-Tertiary rocks in the southern part of the WSA which are exposed along the eastern front of the block. Except for a small outcrop in the Trout Creek Mountains, these are the only rocks of their kind in southeastern Oregon and are the oldest as well. They outcrop from the east slopes near Arizona Creek to Denio, Nevada. Also present are pre-Tertiary granitic rocks which are exposed in the southernmost part of the WSA, about one and one-half miles northeast of Denio. They represent an intrusive igneous body which is somewhat younger than the nearby metamorphic rocks.

On the eastern side of the WSA, extending from the fault block, another type of geologic formation can be seen. This is a metamorphosed conglomerate, consisting of large gravels and cobbles which have been compressed and compacted to form resistant outcrops. The metamorphosed conglomerate is younger than the Tertiary lavas but older than gravel deposits on the valley floor. It has been uplifted and deformed as part of the Pueblo-Steens fault block.

Vegetation occurring in the WSA is a special feature because of the presence of five plant species of special interest and because of the RNA portion of the study area which contains uncommon plants and a narrow leaf cottonwood/Mormon tea community. (The Vegetation section further discusses the five plant species of special interest.)

The presence of bighorn sheep, good quality sheep habitat, and crucial deer and antelope winter range make wildlife values a special feature of the WSA. The study area also provides habitat for a native species of trout. The Whitehorse cutthroat trout has been restocked into its assumed native habitat in Van Horn Creek. This species is found only in a few streams other than Van Horn Creek, including Denio Creek in the Pueblos (south of Van Horn and outside the WSA), the larger streams which drain the eastern side of Steens Mountain, and two drainages in the Trout Creek Mountains.

The outstanding scenery of the study area is another special wilderness feature. The high quality scenic area includes most of the central portion of the WSA and consists of the sestern slope of the eastern ridge, the western ridge, and the high basins and meadows in the interior.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the WSA is located in the Intermountain Sagebrush Province. Some lower elevation areas have a potential vegetation of saltbush-greasewood and the rest of the WSA has a potential natural vegetation of sagebrush steppe.

The WSA contains seven ecosystems listed in the Basin and Range section of the Oregon Natural Heritage Plan. These include big sagebrush/bluebunch wheatgrass, big sagebrush/Idaho fescue, low sagebrush/bluebunch wheatgrass, low sagebrush/Idaho fescue, mountain mahogany community in the southern Basin and Range, narrow leaf cottonwood and Mormon tea community complex and a shadscale-spiny hopsage-budsage community. One ecosystem which occurs in this WSA but is not listed in the Oregon Natural Heritage Plan is three-tip sagebrush/Idaho fescue.

The study area is within 5 hours' driving time of two standard metropolitan statistical areas with population over 100,000: Boise, Idaho, and Reno, Nevada.

Energy and Mineral Development

The geology, energy, and mineral resources of the Pueblo Mountains were evaluated by interpretation of existing literature and review of past and present mining claims or leases and mineral occurrences. Additional information was obtained by BLM through a geochemical survey under contract with the Oregon Department of Geology and Mineral Industries (DOGAMI). Technical details of the evaluation are included in a BLM report titled, "Assessment of Geology, Energy, Mineral Resources, Pueblo Mountains Geologic Resource Area, Harney County, Oregon."

The WSA is within the Pueblo Mountains geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the classification is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

Currently there are over 300 mining claims in this belt within the WSA as of January 1, 1984. Records of mining and mineral occurrences indicate the presence of mercury, copper, and gold in the eastern half of the WSA. Results from a geochemical survey indicate a high favorability for gold, silver, copper, mercury, and molybdenum occurring in the same area. Silver, copper, mercury, and molybdenum are strategic and critical minerals, and deposits of copper and mercury are known to exist in the WSA.

The northern part of the WSA is within an area that has been nominated as an area of critical mineral potential (ACMP) and is considered to have important potential for the occurrence of gold and mercury. ACMPs are areas within existing or "de facto" withdrawals (from mineral development) which are identified by the public as having mineral potential that is important to the local, regional or national economy or which could become economically important in the future. ACMPs are used by BLM to reevaluate the withdrawals.

The eastern and southeastern portions of the study area have moderate favorability for geothermal resources. As of January 1, 1984 there were three geothermal lease applications for that area. There are also five oil and gas leases in the Pueblo Mountains covering 29,970 acres as of January 1, 1984.

Table 3 shows the mineral potential classifications in the study area and map 5 shows the portions of the study area rated with moderate (medium) potential for geothermal resources and high potential for metals, including the area nominated as an ACMP.

Surface rocks in the WSA consist of Permian-Triassic metamorphics, Cretaceous intrusives, Tertiary volcanics and Quaternary alluvial deposits. A north-south belt of mineralization in the eastern half of the study area is associated with the metamorphic rocks and geological contacts and fractures in the volcanics.

Table 3. Classification of Energy and Mineral Potential, Pueblo Mountains WSA (OR-2-81)

Commodity	Area	Classification Level	Confidence Level
Metals (copper, mercury gold, silver, molybdenum)	See map 5	4	D
	Rest of WSA	2	C
Geothermal	See map 5	3	B
	Rest of WSA	1	C
Uranium/Thorium	Entire WSA	2	B
Coal	Entire WSA	1	D
Oil/Gas	Entire WSA	2	B
Tar Sands/Oil Shale	Entire WSA	1	D
Limestone	Entire WSA	2	C
Bentonite	Entire WSA	2	B
Diatomite	Entire WSA	2	B
Zeolites	Part of area (not shown on map)	2	B
	Rest of WSA	1	C
Sodium	Entire WSA	2	A

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

Vegetation

Pueblo Mountains WSA contains a variety of plant communities. The most extensive communities are big sagebrush/bluebunch wheatgrass and big sagebrush/Idaho fescue. Communities which are more local in occurrence are mountain mahogany and three-tip sagebrush.

The big sagebrush/bluebunch wheatgrass community occurs on the lower elevation fans and hills, and at higher elevations on the southern exposures. Bluebunch wheatgrass is generally present only on the steeper slopes.

The successional stage of the lower elevation areas is estimated to be early or mid-seral with the steeper slopes being mid to late seral. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) The climax vegetation on these sites is bluebunch wheatgrass and big sagebrush.

The community on the steep north and east facing slopes and in the higher elevation basins is big sagebrush/Idaho fescue. The estimated successional stage is mid-seral in the basins and mid to late seral on the steeper sites. The major climax species are big sagebrush and Idaho fescue.

Low sagebrush communities also occur on some steep north and east facing slopes and in the higher elevation basins. Most areas are estimated to be mid to late seral, and the probable climax vegetation is Idaho fescue and low sagebrush.

The mountain mahogany community grows on rocky terraces and slopes at higher elevations. The successional stage is estimated to be mid to late seral and the major climax species are mountain mahogany, fescue, and bluegrass.

Small three-tip sagebrush communities occur on north and west facing slopes in the southern end of the Pueblo Mountains. The successional stage of these communities is estimated to be mid to late seral. The probable climax vegetation is three-tip sagebrush and Idaho fescue.

The community on the steep exposed south slopes at the lower elevations on the east side of the WSA includes spiny hopsage, Mormon tea, and purple sage. These slopes are the only place Mormon tea grows in BLM's Burns District. The successional stage is estimated to be mid-seral and the major climax species are desert needlegrass, Indian ricegrass, spiny hopsage, and Mormon tea.

Other important communities scattered throughout the WSA include riparian, meadow, and aspen communities. Riparian vegetation grows along the many perennial streams on both the east and west slopes of the mountains. The major riparian species include willow, alder, aspen, rose, and, on certain drainages, narrowleaf cottonwood. Riparian areas are estimated to be mid-seral. The climax vegetation is not known but probably includes all the shrub species previously mentioned.

The Pueblo Foothills RNA, which is in this WSA, is managed to protect narrowleaf cottonwood and the associated species on the exposed slopes, including Mormon tea.

Meadows are often associated with riparian areas and often occur at elevations above 5,000 feet. The vegetation on the meadows includes several species of bluegrasses and sedges and a variety of forbs. The successional stage is estimated to be mid-seral and the climax vegetation is bluegrass and sedge.

Aspen groves generally occur along streams and sometimes they expand to include many acres, especially in the headwaters of Willow, Cottonwood, and Van Horn Creeks. Aspen groves are estimated to be mid-seral and the climax vegetation is primarily aspen.

Five plant species of special interest (mentioned in the Special Features section) have been discovered in the WSA: *Eriogonum ochrocephalum var. calcareum* (ochre buckwheat), *Melica stricta* (nodding melic), *Phacelia gymnoclada* (thick-leaved phacelia), *Allium bisceptrum* (two-stemmed onion), and *Ranunculus andersonii* (red buttercup). These species are on List 2 of the Oregon Natural Heritage Plan's "Rare, Threatened, and Endangered Plants and Animals of Oregon"

Wildlife

Wildlife habitat types in the Pueblo Mountains range from big sagebrush found at low elevations to aspens and mountain mahogany found at higher elevations. Meadows, cliffs, talus, and riparian habitats are abundant throughout much of the WSA. Water is well distributed.

The WSA has habitat to support a large population of bighorns, and California bighorn sheep were released in the Pueblo Mountains in 1976, 1980, and 1983 by Oregon Department of Fish and Wildlife. Bighorns have been observed infrequently since their release and no critical habitat has been identified.

Antelope winter at low elevations along the north edge of the WSA. The northeastern part of the study area is recognized as crucial winter range for antelope. Antelope summer in some of the basins having low sagebrush cover. The Ten Cent Meadow and Reaux Creek areas in the central and northern portions of the WSA are antelope summer range.

The good interspersion of water, forage, and thermal cover provide good summer range for mule deer. Mule deer winter along the eastern foothills of the WSA and near Denio Basin. The eastern slopes of the WSA have been identified as crucial deer winter range.

Some of the other mammals in the WSA include mountain cottontail, blacktailed jackrabbit, bush-tailed woodrat, canyon mouse, deer mouse, long-eared myotis (bat), coyote and bobcat.

Songbirds in the area include black-throated sparrows in the canyons along the edge of Pueblo Valley, and Brewer's sparrow, western meadowlark, and sage sparrow in upland big sagebrush habitat. Common raptors are golden eagle, American kestrel, prairie falcon, and raven.

Chukars are abundant in the rocky canyons and rimrock found over much of the area. Sage grouse are found near some of the meadows and low sagebrush flats, such as Ten Cent Meadow and Denio Basin. Valley quail are found near brushy drainages.

Sagebrush lizard, side-blotched lizards, western rattlesnake, and bullsnake are found throughout the area.

Although occupying only a small part of the WSA, riparian habitat contains a rich diversity of wildlife species. Common bushtit, ruby-crowned kinglet, dipper, yellow warbler, yellow-rumped warbler, and robin are some of the songbirds using riparian habitat. Riparian habitat is found along most of the streams flowing out of the area. At least 17 miles of stream riparian habitat are found in the WSA.

Whitehorse cutthroat trout were released in Van Horn Creek in 1976 and 1980 and have become established there.

Two wildlife projects are proposed for the study area. The projects involve stream channel improvements in Van Horn Creek and Denio Creek to improve and expand habitat for the Whitehorse cutthroat trout. The proposal includes the development of 10 instream structures in each drainage within the WSA, which would create pools or help to stabilize streambanks. The structures would be implemented along a l/2- to 1-mile section of each stream. Also proposed is the introduction of Whitehorse cutthroat trout in the upper reaches of Denio Creek which is within the study area.

Livestock Grazing

Portions of two grazing allotments are within the Pueblo Mountains WSA. Table 4 summarizes existing and potential livestock use in the study area in AUMs (animal unit months, the amount of forage needed to sustain one cow and a calf, or equivalent animals, for one month)

Livestock improvements are proposed in the WSA for the portion within the Pueblo-Lone Mountain allotment to increase forage production, allow for better livestock distribution and improve management. They include 5,420 acres of brush control and seeding, 34 miles of fence, 1 spring development, 5 miles of pipeline, 3 reservoirs and an 18,000-gallon storage tank. These improvements would increase forage in the WSA portion of the Pueblo-Lone Mountain allotment. The projects are part of a total allotment plan affecting three other WSAs in the vicinity, including the adjacent Rincon WSA. The AUMs produced by these projects would not result in an increase in licensed use, but would be used to offset possible reductions of 4,000 AUMs allotment-wide (3,800 of which is within the 4 WSAs).

Existing livestock improvements within the WSA (among the man-made developments mentioned in the Naturalness section) include five reservoirs, four developed springs, a water tank, and one mile of fence.

Grazing operators presently use motorized vehicles within the WSA to monitor livestock and haul salt. Horses are used for gathering and managing livestock.

Recreation Use

Recreation is one of the major land uses of the Pueblo Mountains WSA. Some of the recreational use is associated with motor vehicles while a good portion is associated with primitive types of recreation.

Table 4. Existing and Potential Livestock Use, Pueblo Mountains WSA (OR-2-81)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Reductions in WSA (AUMs)
Pueblo-Lone Mtn. (No. 6020)	19,329	4/16 - 02/28	23	4,270	160
Denio Basin (No. 6021)	323	6/01 - 10/31	50	205	0
Totals	19,652			4,475	160

Hunting for deer, antelope and upland game occurs throughout the WSA. Deer hunting is above average and is estimated to provide high visitor use. Antelope hunting is low. Hunting for upland game accounts for moderate visitor use. Chukar, quail, and dove are the primary birds which are hunted. Sage grouse hunting was permitted by a controlled hunt (where a limited number of permits are issued) in October 1983 for the first time in many years.

Low visitor use is associated with fishing in Van Horn Creek.

An Oregon State Recreational Trail runs along the Pueblo Mountain ridge. This section of the Desert Trail is 22 miles long, beginning in Fields, Oregon, and ending in Denio, Nevada. About 11 miles of the trail are within the Pueblo Mountains WSA. The trail receives high use.

The use of vehicles for recreation is mostly associated with hunting. The majority of hunters for nearly all game species use vehicles for access into the study area.

Economic Value and Local Income

Livestock grazing, oil and gas leasing, and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were 5 oil and gas leases in the WSA. There were no geothermal leases on the WSA.

Economic value and local personal income generated from existing levels of resource outputs of these lands are presented in table 5. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 69,310 acres to the National Wilderness Preservation System (NWPS). It would preserve wilderness values and special features in an area which includes an impressive tilted fault-block mountain range and the second highest mountain in southeastern Oregon. This area also includes a series of high-elevation drainage basins and meadows, which contain the headwaters for several perennial streams.

Designation of the area as wilderness would reduce vehicle use within the study area. Although the dead-end roads which enter the area would remain open, closing approximately 32 miles of vehicle ways and prohibiting cross country (off-road) vehicle use would improve the naturalness of the area by allowing the ways to revegetate and become less noticeable and by preventing new ways from being formed as a result of cross country travel.

Opportunities for solitude and primitive recreation would also be improved by reducing the disturbing effects of vehicles. With the continued use of the dead-end roads, such disturbance from vehicles would not be eliminated.

The potential for surface disturbing activities such as mineral development also would be reduced. However, if any claims were determined to be valid at the time the area was designated wilderness, mineral development on those claims could continue. This could have an adverse impact on portions of the WSA near the eastern boundary and would primarily affect naturalness in those places that had received little previous disturbance. Mineral development also could occur on the split-estate inholdings and access could be constructed across public lands as a part of the development of the inholdings. This could adversely affect wilderness values.

Within the remainder of the study area, no new surface disturbance from mineral development would be permitted. This would have the beneficial effect of maintaining the area's natural appearance as well as maintaining opportunities for solitude and recreation. The special features within the study area would also be protected from mineral development.

Table 5. Economic Value and Local Personal Income Generated Annually, Existing Program, Pueblo Mountains WSA (OR-2-81) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	4,475	$33,742	$37,322
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil and Gas leases	Acres	29,970	29,970	9,025
Total			$63,712	$46,347

The botanical and wildlife values of the study area would be preserved including a number of plants of special interest and a unique vegetative community. Bighorn sheep, crucial deer winter range, and a wide variety of game and nongame wildlife and their habitat would also be protected.

Wilderness designation under the **enhanced wilderness alternative** would add 78,240 acres to the NWPS, including the 4,785 acres of public land outside the WSA and assuming the 8,225 acres of interior and adjacent parcels of private and split-estate land could be acquired. Wilderness values and special features would be preserved under this alternative in the same manner as under the all wilderness alternative.

This alternative would enhance naturalness and opportunities for solitude by closing the dead-end roads which enter the WSA. Also, acquisition of the split-estate inholdings would eliminate the possibility of development and the need for access to these scattered parcels.

No development is currently planned for these lands, but most fall within portions of the study area with high favorability for the occurrence of metals. Potential manageability problems caused by the impacts of development as well as the need for access would also be avoided under this alternative.

Acquisition of the adjacent private and split-estate parcels (mostly in the north-central portion of the WSA) and relocation of the boundary along a road would improve identification of the boundary, which currently falls along legal subdivisions, and consequently improve manageability of the area. The possibility of development on these lands would also be precluded, decreasing the chance of additional outside sights and sounds which could adversely affect naturalness of the area.

Closing all 12 dead-end roads (totaling 17 miles), in addition to closing the ways, would eliminate vehicle use in the area and improve the WSA's manageability by preventing the possibility of vehicle intrusions on solitude. These closures would also enhance both manageability and naturalness by reducing the opportunity for off-road-vehicle use and the resulting surface disturbance. The existing roads would be allowed to revegetate, making them less visible within the study area, and enhancing naturalness.

A boundary adjustment on the eastern side of the study area would improve manageability of the WSA under this alternative. Recommending relatively small portions nonsuitable along the eastern side would improve boundary identification and avoid potential manageability problems from expansion of existing mineral developments outside the WSA. Although the wilderness characteristics within the nonsuitable portions would not be preserved, the only notable wilderness values identified in those areas are plant species of special interest.

The **partial alternative** would add 43,245 acres to the NWPS, assuming 4,370 acres of private and split-estate land could be acquired. As with the all and enhanced wilderness alternatives, the wilderness values and special features in the area recommended suitable, the central core of the study area, would be preserved in their present condition.

This part of the study area still retains the area's basic wilderness characteristics of being in a natural condition and possessing outstanding opportunities for solitude and primitive recreation. The wilderness under this alternative would also include some of the area's special features such as bighorn sheep, scenic values, areas of geological interest and some plant species of special interest.

Closure of approximately 24 miles of ways and 5 miles of dead-end roads would enhance the area's naturalness, manageability, and opportunities for solitude.

The wilderness values and special features in the nonsuitable portions of the study area could be subject to disturbance from developments and vehicle-oriented recreation.

The proposed brush control and seeding project would be allowed in the nonsuitable portion under this alternative and would occur along the western side of the WSA.

Mineral development would be permitted in the portions recommend as nonsuitable for wilderness. Development would most likely occur along the eastern side of the study area since this portion has high potential for the occurrence of metals and moderate potential for the occurrence of geothermal resources.

All of these developments (range or mineral) would adversely affect the naturalness of the nonsuitable area by disturbing native vegetation or the existing contour of the land. Opportunities for solitude would be adversely affected as a result of new developments. This could be especially true along the eastern side where mineral development could result in increased human activity and the need for increased access to development sites. Access for the proposed range developments would not have as strong an impact on solitude because they would be confined to an area immediately adjacent to the western boundary, and maintenance would be relatively infrequent.

Adverse impacts on primitive recreational opportunities would be caused primarily by increased disturbance from potential mineral development and increased access in the nonsuitable portion on the eastern side of the study area. Mineral development within areas such as the Van Horn or Cottonwood Creek drainages could adversely affect the quality of primitive recreation in these highly scenic and attractive areas.

Special features in the nonsuitable portions under this alternative would be subject to disturbance from other activities or resource uses. Primarily affected would be the crucial deer winter range which occurs along the eastern boundary.

Under the **no wilderness/no action alternative**, all of the wilderness values and special features which occur in the WSA would be subject to adverse effects from competing resource uses and activities. Under this alternative, the entire study area would be open to potential mineral development including the eastern two-thirds of the WSA, which has high potential for metallic mineral occurrence.

Development of mineral resources within this portion of the WSA could have adverse impacts on the area's wilderness character beyond those identified under the partial alternative. This would be especially true if any development were to occur within the central portion of the WSA. Much of this part of the WSA is highly visible from a variety of locations as it lies between two prominent ridgelines. Naturalness and opportunities for solitude and primitive recreation could be adversely affected by mineral development. Some of the area's important special features (bighorn sheep and scenic quality) could also be affected by development occurring within the central portion of the study area, depending upon the location and extent of development.

Effects on Energy and Mineral Development

Areas designated wilderness under the various alternatives would be withdrawn from mineral exploration and development.

Table 6 shows the acres of land that would be withdrawn under each alternative, including the acres that have been classified as having moderate or high potential for occurrence of minerals and the nominated Area of Critical Mineral Potential.

Effects on Vegetation

The potential impacts on vegetative composition, ecological succession, and plants of special interest in this WSA are related to proposed vegetative manipulation projects and livestock grazing.

Areas designated wilderness would not be subject to most surface disturbing activities. Vegetation dependent upon the existing undeveloped

Table 6. Effects of Alternatives on Energy and Mineral Development, Pueblo Mountains WSA (OR-2-81)

	Acres Withdrawn			
	All Wilderness	Enhanced Wilderness	Partial (Preferred)	No Wilderness/ No Action
Total area	69,310	70,015 [2]	38,875 [3]	0
Metals rated high (gold, silver, copper [1], mercury [1], molybdenum)	39,240	38,680	16,880	0
Geothermal rated moderate	17,870	9,900	2,560	0
Area nominated as ACMP	18,640	21,520	8,640	0

[1] Deposits of copper and mercury, strategic and critical minerals, are known to exist in the WSA.

[2] Includes 4,785 acres of public land outside WSA to be added under this alternative. Development would also be precluded on an additional 8,225 acres if split-estate and private and is acquired as proposed under this alternative.

[3] Development would also be precluded on an additional 4,370 acres if split-estate and private land is acquired as proposed under this alternative.

environment would thus be maintained.

The **partial and no wilderness/no action alternatives** would allow the proposed vegetative manipulation projects. There would be brush control and seeding of 5,420 acres of big sagebrush community, resulting in a reduction of vegetation diversity by temporarily eliminating shrubs and forbs and converting vegetation to crested wheatgrass. With the introduction of a non-native species, the successional stage of this community would remain at early seral. There are no known plant species of special interest on this site.

The ONHP plant species of special interest, which tend to be concentrated in the nonsuitable portion of the partial alternative, would be subject to disturbance since they are not formally protected. However, the ONHP species could be designated BLM sensitive species and as such would receive the same protection as federally listed threatened or endangered species.

Some plant species would be protected in the Pueblo Foothills Research Natural Area, but because the area would not be withdrawn from mineral development, it could still be subject to surface disturbing activities.

Effects of Wildlife

Under all of the alternatives, the proposed fences and water developments designed to improve livestock use within the WSA, if allowed, could have a beneficial impact on wildlife. These developments would allow for establishment of grazing systems which would change the current pattern of livestock use. As a result, riparian habitat could be improved, benefitting Whitehorse cutthroat trout, deer, and a variety of nongame species. In addition, meadow habitat could also improve, affecting such species as antelope, sage grouse and common snipe.

Under the **all wilderness, enhanced wilderness and partial alternatives** the stream channel projects proposed for Van Horn and Denio creeks might or might not be allowed depending on a site-specific analysis to determine whether they conform with Wilderness Management Policy. If not allowed, the opportunity to improve and expand the habitat for the Whitehorse cutthroat trout would be foregone. Opportunities to expand the habitat of this uncommon species of fish would also be foregone if efforts to introduce the fish in the upper reaches of Denio Creek were not allowed.

The all wilderness alternative would essentially maintain the area's wildlife habitat in its present condition. Vehicle-oriented hunting would probably not decline substantially, and there would not be a substantial change in big game populations.

The proposed crested wheatgrass seedings would be precluded under this alternative, and potential habitat for an additional 50 antelope would be foregone. Overall effect on existing wildlife populations would not be significant under this alternative. The enhanced wilderness alternative would have impacts on wildlife similar to those under the all wilderness alternative. The primary differences would be a further reduction of access (closure of dead-end roads) affecting hunting in the area, but it would not result in a substantial change in big game populations. Overall, there would not be a significant effect on most wildlife populations under this alternative.

The partial alternative would maintain the bighorn sheep and other wildlife habitat areas found in the central portion of the Pueblo Mountains WSA. The impacts from vehicle way and road closures within the wilderness would be similar to those under the all and enhanced wilderness alternatives. Under this alternative, the development of crested wheatgrass seedings in the western side of the WSA would have a beneficial effect on antelope populations. Other wildlife populations would not be significantly affected under this alternative.

Under the **no wilderness/no action alternative**, antelope populations would increase after lands along the west side of the study area were seeded to crested wheatgrass. Stream channel projects in Denio and Van Horn creeks would be allowed under this alternative increasing the habitat available for Whitehorse cutthroat trout and allowing for the introduction of this fish in the upper end of Denio creek.

Effects on Livestock Grazing

The Pueblo Mountains WSA is one of four WSAs located within the Pueblo-Lone Mountain allotment. Water developments are proposed in all four WSAs and fences and seedings are proposed in the Pueblo Mountains and Rincon WSAs. These projects would allow for shifting of livestock use from apparently overgrazed areas within the Pueblo Mountains and Rincon WSAs, and areas outside the WSAs, to areas with unused grazing capacity in the Rincon, Basque Hills and Hawk Mountain WSAs.

Preliminary and inconclusive data indicate that grazing in portions of the Pueblo-Lone Mountain allotment, including portions of the Pueblo Mountains and Rincon WSAs, could exceed the grazing capacity by 4,000 AUMs (approximately 19 percent of the total licensed use in the allotment). Other portions of the allotment are not grazed at all due to lack of water and fences to keep livestock confined to those areas. (The preliminary estimate of the amount of overgrazing is subject to refinement as the effects of livestock grazing in the Pueblo Mountains and Rincon WSAs are monitored.)

The fences, water developments and seedings proposed for the allotment are all necessary for the implementation of a grazing system. Under such a system, pastures are developed and some are rested, deferred or grazed in cycles to allow the forage some relief from grazing during the critical growing period.

Under the **all and enhanced wilderness alternatives**, the proposed brush control and seeding to crested wheatgrass and the structural development associated with these seedings (fencing and pipelines) would not be developed. The remaining structural developments might or might not be allowed under these alternatives depending on a site-specific assessment of whether they conform to Wilderness Management Policy. If these projects are not allowed, additional forage to be used to improve management through implementation of a new grazing system and to alleviate apparent overgrazing in the allotment would be foregone. Licensed use could be reduced by up to 160 AUMs under the all wilderness alternative and 167 AUMs under the enhanced wilderness alternative in the absence of these projects.

The proposed seeding has a benefit/cost ratio less than 1:1, and the structural improvements proposed within the study area have a benefit/cost ratio greater than 1:1.

Under the **partial alternative**, the proposed brush control and seeding and most of the structural projects would be allowed since they are outside the area recommended as suitable for wilderness. Three reservoirs and 7 miles of fence are within the area recommended suitable for wilderness, and might or might not be allowed, depending on a site-specific assessment of whether they conform with Wilderness Management Policy. These projects would make available additional forage and would contribute to the implementation to a new grazing system. If the projects are not allowed, licensed use could be decreased by up to 14 AUMs.

In the **no wilderness/no action alternative**, all of the proposed projects would be allowed. Opportunities to produce forage through brush control and seeding and to make additional forage available would be realized. This would contribute 160 AUMs toward forestalling a reduction up to 4,000 AUMs of licensed use allotment-wide.

Under the all wilderness alternative, closing of ways would not be a substantial inconvenience to the operator. Under the enhanced wilderness alternative, closing the dead-end roads would make it inconvenient for the grazing operator to distribute salt. Closing the roads under the partial alternative would not be a problem to the grazing operator.

Under the no wilderness/no action alternative, the roads would remain open and available to the livestock operator.

Effects on Recreation Use

Opportunities for primitive recreation would be preserved or improved under the **all wilderness alternative**. The quality of primitive recreation in the study area would be improved with the closure of vehicle ways and restrictions on off-road vehicle use. This would result in a reduction of vehicle-oriented recreation, primarily hunting. Because the roads into the study area would remain open to vehicles and because of changes in hunting patterns (less vehicle-oriented), it is estimated that reductions in hunting use would not be significant under this alternative.

Under the **enhanced wilderness alternative**, primitive types of recreation would also be preserved or improved. Closure of both roads and ways would essentially eliminate vehicles in the WSA, further enhancing the quality of primitive recreation beyond that of the all wilderness alternative. This action would have the most impact on vehicle-oriented recreation. Even though vehicles would not be permitted for hunting, it is likely that hunting would continue.

Acquisition of adjacent lands and inholdings under the enhanced alternative would improve recreation by eliminating possible recreation use restrictions on the inholdings. Recommending portions of the WSA nonsuitable under this alternative would not have a substantial effect on primitive recreation opportunities.

Under the enhanced wilderness alternative, and to some degree under the all wilderness alternative, it is likely that overall recreation use in the WSA would decline. It is not expected that this would be a substantial decline for a number of reasons.

First, the major reason for the decline would be the restrictions on vehicle use. Because of shifts in the types of hunters and continued vehicle-oriented hunting around the perimeter of the WSA, hunting would not be eliminated from the area. In addition, after an initial decline in hunting due to road closures, hunting that is not vehicle-oriented would increase over time if the area proved to be popular for this type of hunter.

Second, the existing use of the Desert Trail indicates an interest for desert-type recreation within a setting such as the Pueblos. It is likely that the use of the trail would increase to some extent and make up for some of the loss in hunting use.

Third, the fact that the Pueblo Mountains is an extremely attractive area would encourage continued and additional use of the area for recreation.

The **partial alternative** would protect the recreation values associated with the central portion of the WSA. Opportunities for day hiking, backpacking, sightseeing, etc., are outstanding within this part of the study area and wilderness designation would preserve those opportunities. Overall recreation use probably would not decline and could even increase under this alternative. Although some vehicle-oriented recreation would be lost due to road closures, shifts in type of hunters and probable increases in the use of the Desert Trail could more than offset the loss of vehicle-oriented recreation.

The area recommended nonsuitable under the partial alternative would continue to be available for vehicle-oriented hunting. Primitive recreation in these portions would be subject to disturbance from vehicle-oriented recreation and development of the land for other purposes.

Under the **no wilderness/no action alternative**, primitive recreation would be subject to disturbance from other land uses such as continued vehicle use and the development of range improvements.

Slight increases in wildlife populations could occur under all of the alternatives depending on the number of livestock projects allowed, which would result in corresponding increases in recreation use (primarily hunting). These increases would not significantly change recreation use under the all and enhanced wilderness alternatives. There would be a greater increase under the partial and no wilderness/no action alternatives as these alternatives would have the maximum benefit to wildlife.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presemted in tables 7 and 8. Table 7 shows the effects on economic value and table 8, the effects on local personal income. It is not known at this time whether individual proposed structural projects for this WSA would be constructed if the area were designated wilderness. It is known that vegetative manipulation projects would not be allowed (and structural projects dependent on these projects would not be built).

Currently vehicles are used for livestock management in the study area. The enhanced wilderness alternative would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $1,209 per year.

Table 7. Effects of Alternatives on Annual Economic Value, Pueblo Mountains WSA (OR-2-81) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	Partial (Preferred)	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Grazing:					
Investment [1]	AUM	0 to +78	0 to +82	+146 to +160	+160
Adjustments [2]	AUM	-160	-167	-160	-160
Big game hunting [3]	RVD	0 to +125	0 to +125	+141 to +203	+203
Upland game hunting [3]	RVD	0 to +12	0 to +12	+6 to +12	+12
Oil and Gas Leases	Acres	-29,970	-33,385	-27,450	0
VALUE OF PLANNED INVESTMENTS [4]					
Grazing	$	0 to +588	0 to +618	+1,101 to +1,206	+1,206
Big game hunting	$	0 to +2,836	0 to +2,836	+3,199 to +4,606	+4,606
Upland game hunting	$	0 to +376	0 to +376	+188 to +376	+376
Total [5]	$	0 to +3,800	0 to +3,830	+4,488 to +6,188	+6,188
Investments [6]	$	0 to -5,338	0 to -5,902	-15,754 to -18,167	-18,167
Net Economic Value [7]	$	-1,538 to 0	-2,072 to 0	-11,979 to -11,266	-11,979
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS					
Grazing:					
Adjustments	$	-1,206	-1,259	-1,206	-1,206
Reduced access [8]	$	0	-1,209	0	0
Oil and Gas Leases	$	-29,970	-33,385	-27,450	0
Total	$	-31,176	-35,853	-28,656	-1,206
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS					
All categories [9]	$	-32,714 to -31,176 (-29,970)	-37,925 to -35,853 (-34,594)	-40,635 to -39,922 (-27,450)	-13,185 (0)

[1] Expected future increases due to range improvement investments.

[2] Adjustment for possible reduction in grazing is based on inconclusive data and may not be necessary.

[3] Expected future increases from proposed wildlife and livestock projects.

[4] Vegetative manipulation projects involving up to $154,230 total expenditures, and structural projects involving up to $66,250. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[5] Detail may not sum to "Total" due to rounding.

[6] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[7] For alternatives reflecting a range of negative net values (i.e., investments costs exceeding benefits), the figures are reversed to show the larger negative value as the lower end of the range (e.g., -20 to 0) so that the summation of effects for all categories in each column will show the full range of potential effects.

[8] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

[9] See footnote 2. If the grazing adjustment is found to be unnecessary, compensating improvements would not be developed. Investments and grazing adjustments would be zero. The effects of this case are shown in parentheses.

Table 8. Effects of Alternatives on Local Personal Income, Pueblo Mountains WSA (OR-2-81) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	Partial (Preferred)	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Grazing:					
Investment [1]	AUM	0 to +78	0 to +82	+146 to +160	+160
Adjustments [2]	AUM	-160	-167	-160	-160
Big game hunting [3]	RVD	0 to +125	0 to +125	+141 to +203	+203
Upland game hunting [3]	RVD	0 to +12	0 to +12	+6 to +12	+12
Oil and Gas Leases	Acres	-29,970	-33,385	-27,450	0
INCOME FROM PROPOSED INVESTMENTS [4]					
Grazing	$	0 to +653	0 to +686	+1,222 to +1,339	+1,339
Big game hunting	$	0 to +1,241	0 to +1,241	+1,400 to +2,016	+2,016
Upland game hunting	$	0 to +185	0 to +185	+92 to +185	+185
Construction Activity [5]	$	0 to +8,883	0 to +9,822	+26,217 to +30,232	+30,232
Total [6]	$	0 to +2,079	0 to +2,112	+2,714 to +3,540	+3,540
INCOME FROM OTHER EXPECTED OUTPUT CHANGES					
Grazing:					
Adjustments	$	-1,339	-1,398	-1,339	-1,339
Oil and Gas Leases	$	-9,025	-10,054	-8,267	0
Total	$	-10,364	-11,393	-9,606	-1,339
INCOME FROM ALL OUTPUT CHANGES					
All categories [7]	$	-10,364 to -8,285 (-9,025)	-11,393 to -9,281 (-10,054)	-6,892 to -6,066 (-8,267)	+2,201 (0)

[1] Expected future increases due to range improvement investments.

[2] Adjustment for possible reduction in grazing is based on inconclusive data and may not be necessary.

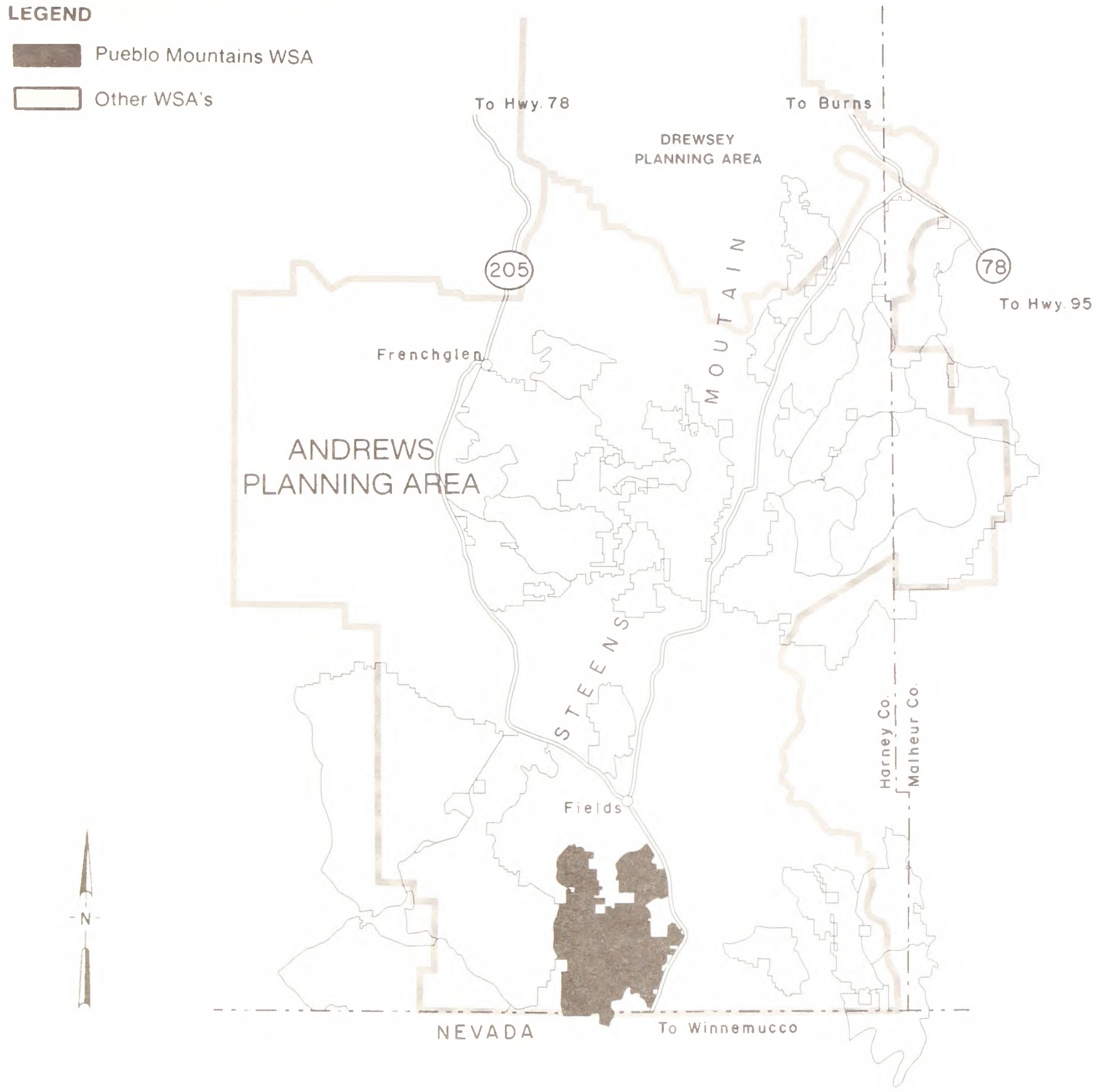
[3] Expected future increases from proposed wildlife and livestock projects.

[4] Vegetative manipulation projects involving up to $154,230 total expenditures, and structural projects involving up to $66,250. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[5] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[6] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 5.

[7] See footnote 2. If the grazing adjustment is found to be unnecessary, compensating improvements would not be developed. Investments and grazing adjustments would be zero. The effects of this case are shown in parentheses.



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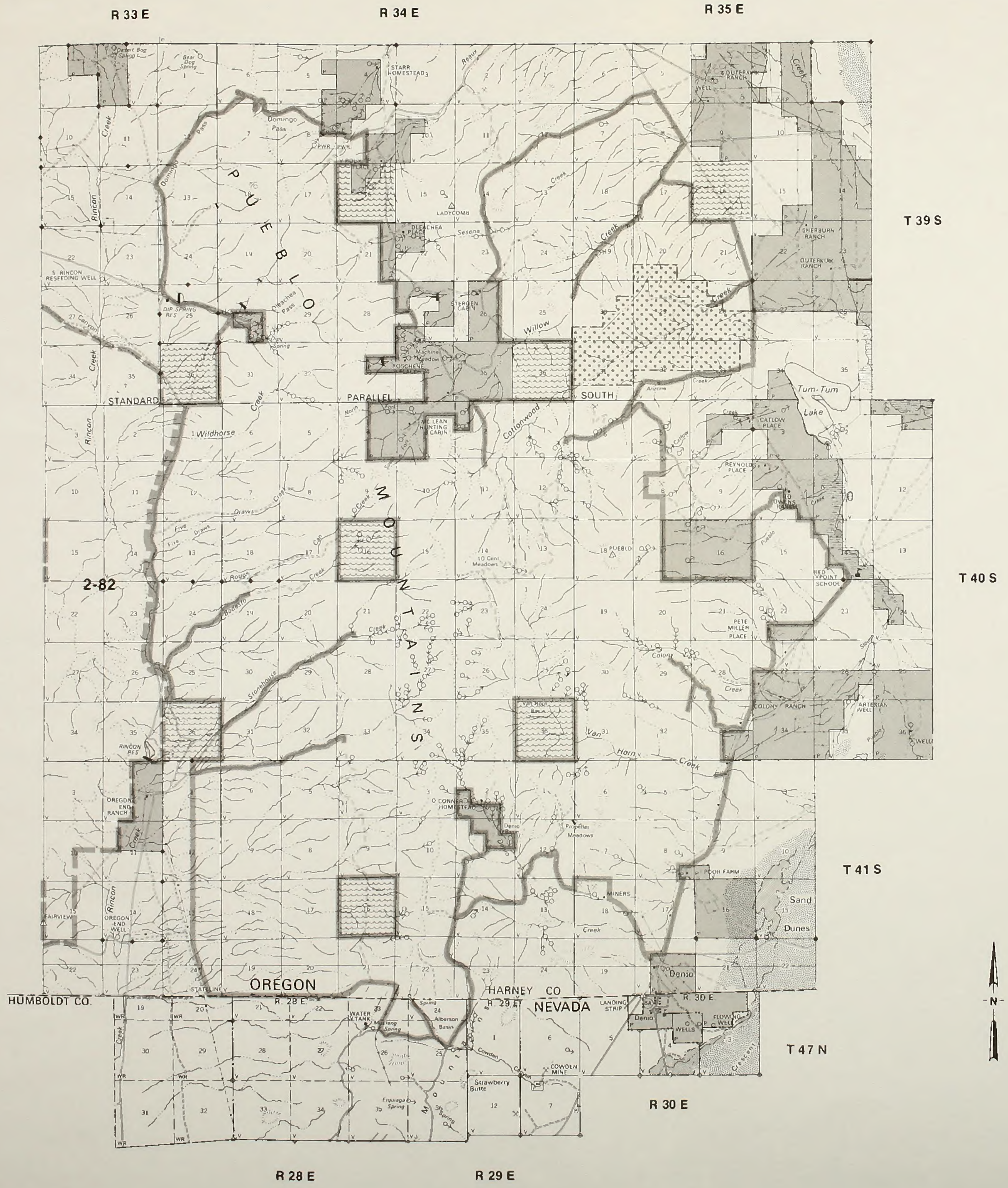
Burns/Winnemucca Districts

Pueblo Mountains WSA
OR-2-81

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

- Wilderness Study Area Boundary
- Boundary of Adjacent Wilderness Study Areas
- ☐ Bureau of Land Management
- ▨ Private
- ▤ BLM Surface-State or Private Subsurface (Split Estate)
- ░ Pueblo Foothills Research Natural Area

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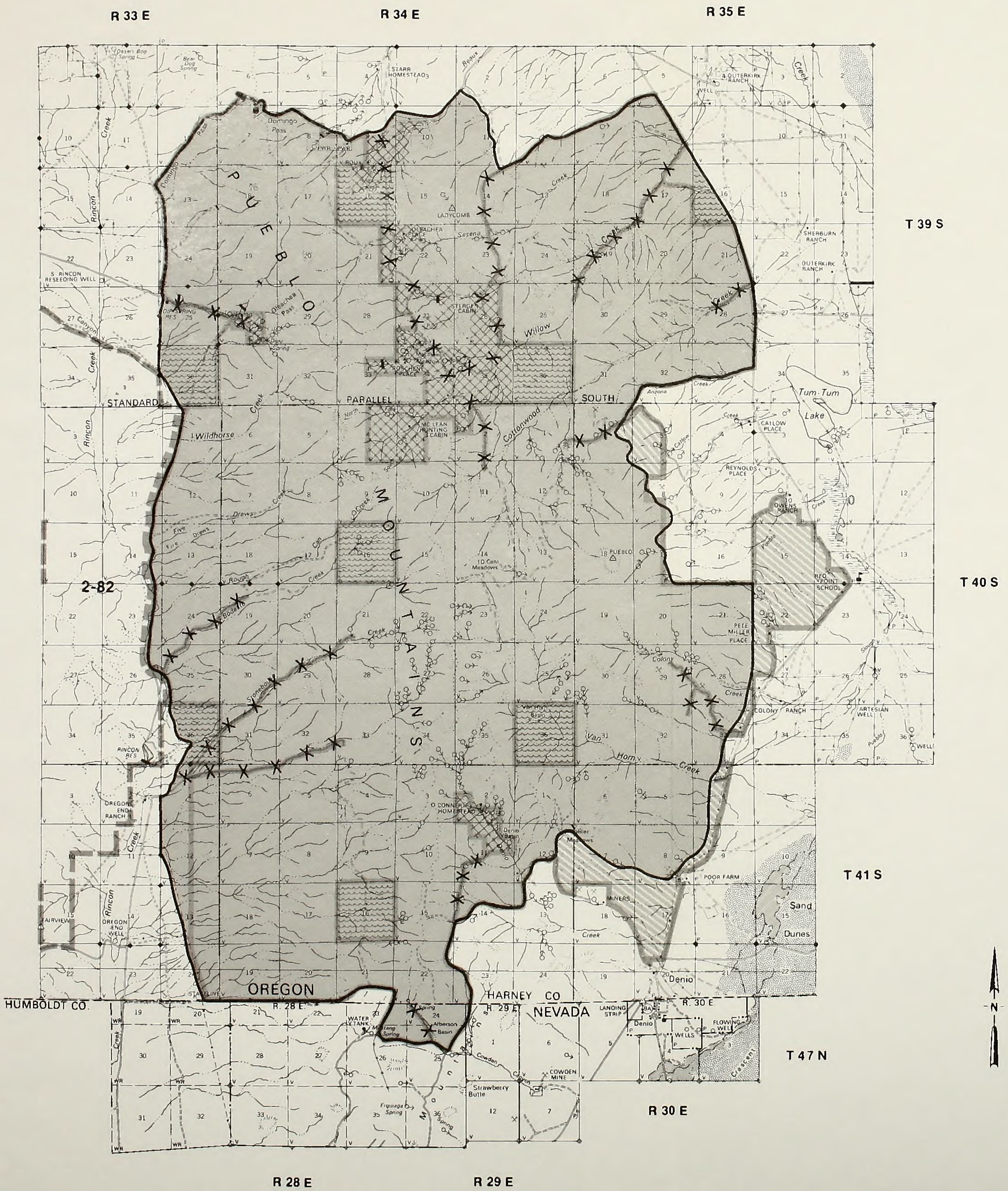
Pueblo Mountains WSA
OR-2-81

LAND OWNERSHIP

0 1 2 MILES

MAP 2



LEGEND

- Wilderness Study Area Boundary
- Boundary of Adjacent Wilderness Study Areas
- Recommended Suitable for Wilderness
- ▨ Recommended Non-suitable for Wilderness
- ▨ Non-Federal Land within Recommended Wilderness
- ▨ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness
- X—X Recommended Road Closure

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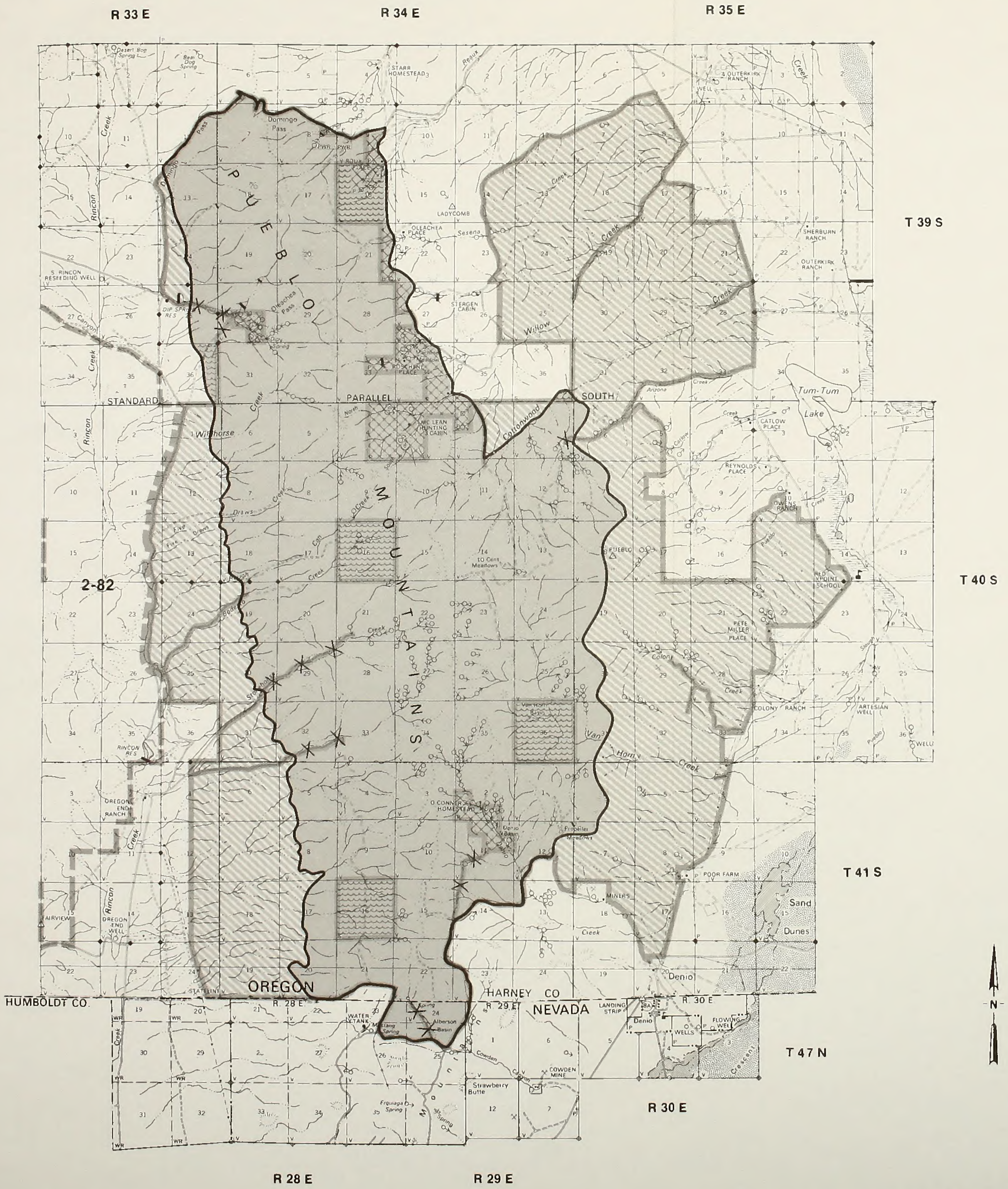
Pueblo Mountains WSA
OR-2-81

ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3



LEGEND

- ▬ Wilderness Study Area Boundary
- ▬ ▬ Boundary of Adjacent Wilderness Study Areas
- ☐ Recommended Suitable for Wilderness
- ▨ Recommended Non-suitable for Wilderness
- ▩ Non-Federal Land within Recommended Wilderness
- ▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness
- ✕ ✕ Recommended Road Closure

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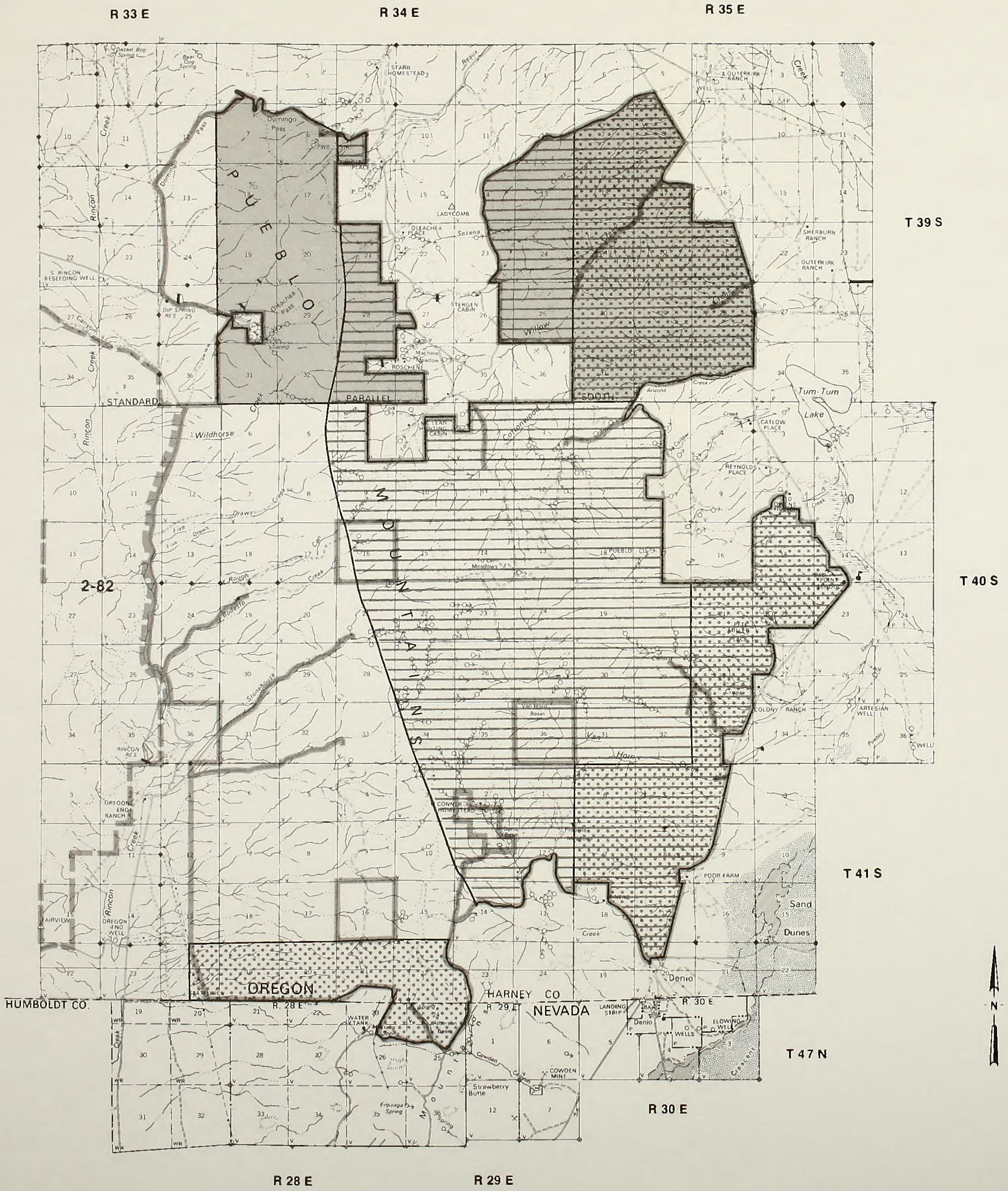
Pueblo Mountains WSA
OR-2-81

PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 4



▨ Medium Potential (3C) for Geothermal Resources

▤ High Potential (4D) for Copper, Mercury, Gold Silver and Molybdenum

▩ Portion of WSA within Nominated Area of Critical Mineral Potential

NOTE: See users guide for map symbols

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Pueblo Mountains WSA
OR-2-81

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 5

Pueblo Mountains WSA, OR-2-81. The southern end of the study area looking north at the western slope of the western ridgeline. Within the area recommended suitable under the enhanced alternative. Except for the lower slopes on the western side of the WSA, this ridgeline is suitable under the partial (preferred) alternative. Although cut by stream drainages this portion of the WSA appears much like a table top tilted to the west at nearly a 45° angle. August 1983.

Pueblo Mountains WSA, OR-2-81. The Ten Cent Meadow area looking north at private land surrounded by the WSA. Portions of the fore and midground on the left and right are within the WSA. The middle view area contains considerable private land. Most of the low ridges and hills in the middle of the photo are suitable under the enhanced and partial (preferred) alternatives. The features visible from this location include the Steens Mountain ridgeline (background center), the high Steens (background right of center) and Alvord Lake (light colored area on the right below the Steens). August 1983.

Pueblo Mountains WSA, OR-2-81. Looking to the southeast from the west side of the meadow in the north central portion of the WSA. The boundary for the partial (preferred) alternative would run along the crest of the ridge leaving most of the visible area within the area recommended suitable under the enhanced and partial (preferred) alternatives. The Ten Cent Meadow area is nearly surrounded by mountain mahogany. The ridgeline in the middle ground is the eastern ridgeline of the mountains south of Pueblo Peak. August 1983.

Pueblo Mountains WSA, OR-2-81. Looking to the west from a ridge above Cottonwood Creek in the northern portion of the WSA. All of this area is recommended suitable under the enhanced and partial (preferred) alternatives. The steep eastern face of the western ridgeline, rises high above an interior valley. August 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Rincon Wilderness Study Area (OR-2-82)

General Description of the Study Area

The Rincon wilderness study area (WSA) is located about 95 miles south of Burns, ten miles west of Fields and 1 mile north of the Oregon/Nevada border in Harney County (see map 1). The WSA is 24 miles south of the end of Oregon State Highway 205 and 8 miles north of Nevada State Highway 140.

The WSA straddles about five miles of BLM's Burns and Lakeview district boundary. Only a very small portion of the study area, the southwestern corner lies within the Lakeview District. The shape of the study area includes a panhandle extending to the north from the main portion of the WSA.

The WSA contains 97,545 acres of public land (see map 2). Also, within the study area are two parcels of private inholdings totaling 120 acres and 5,120 acres (eight sections) of split-estate inholdings (federally managed surface, state or privately owned subsurface mineral rights).

The Rincon study area is 23 miles long (including the panhandle) and 12 miles wide. The area is bounded almost entirely by roads. The northern boundary is formed by the Long Hollow Road (county-maintained) and by some private land. The eastern boundary is comprised of several BLM roads, scattered parcels of private and state land, and the Rincon crested-wheatgrass seeding. The southern and southwestern boundary is formed by a BLM-maintained road (the Long Draw Road) and a portion of the Hawk Valley crested wheatgrass seeding. The western boundary is formed by the Funnel Canyon Road (BLM-maintained).

Four dead-end roads enter the study area and also form part of the boundary. All of these roads enter the WSA from the eastern boundary and are used for access to water developments. Two of the dead-end roads (each 1.5 miles in length) are in the northern portion of the study area. The other two dead-end roads are located in the central portion of the WSA and are 6 miles and 4.5 miles long.

The Rincon WSA contains a variety of physical features including a portion of the Catlow Rim, Lone Mountain, and Oregon End Table. On the northwest side in the panhandle, Catlow Rim extends almost 15 miles in the WSA and reaches an elevation of 6,350 feet at Square Mountain in the north end of the WSA. Another 20 miles of the Catlow Rim are located north of the WSA.

The part of Catlow Rim within the WSA has several deep canyons with intermittent streams and is characterized by rugged westerly facing rock cliffs. A flat open valley (part of the Catlow Valley) lies between the toe of the Catlow Rim and the western boundary road in the northwest portion of the WSA. Along this boundary road in the Catlow Valley is the study area's lowest elevation, 4,450 feet. Also, within this area along the rim is the study area's greatest elevation difference in a short distance: an 1,800-foot drop from the top of Square Mountain to the Catlow Valley within a distance of about 1 mile.

The southwestern corner of the WSA contains the Lone Mountain area which extends 6 miles to the east from the western boundary. Lone Mountain and the surrounding hills are characterized by rock pinnacles and columns of volcanic origin. The summit of Lone Mountain near the southwest boundary is the highest point in the study area, reaching an elevation of 6,903 feet. (The average elevation of the study area is approximately 5,500 feet.)

A large, generally flat valley lies between Lone Mountain and Oregon End Table to the southeast. Oregon End Table is a large flat-topped plateau (3 miles by 5 miles). This area is extremely rocky and is characterized by rimrock around the table's edge.

The vegetation in the WSA is relatively uniform. Big sagebrush and low sagebrush are the dominant species with big sagebrush being more widespread.

Interrelationships

Three other wilderness study areas are adjacent to the Rincon WSA. On the southeastern side of the study area lies the Pueblo Mountains WSA (OR-2-81); along the south is Hawk Mountain WSA (OR-1-146); and on the west is the Basque Hills WSA (OR-2-84). Each of these areas is separated from the Rincon WSA by a road which is maintained by BLM and private landowners on an as-needed basis.

The Pueblo-Lone Mountain grazing allotment embraces parts of all four WSAs. Proposals to construct range improvements in the Rincon WSA are related to grazing management in the other three WSAs and to a proposed pipeline in the Basque Hills WSA.

The 440-acre Long Draw research natural area (RNA) straddles the boundary road between the Hawk Mountain and Rincon wilderness study areas. About 20 acres of the RNA lie within the Rincon study area, because the RNA boundary is drawn along legal subdivisions. The RNA was designated to protect an excellent stand of Indian ricegrass and needle-and-thread grass, but neither of these vegetative communities is found within the study area. Proposed management of the RNA includes fencing the vegetative features, but the enclosure would not extend into the Rincon WSA. Management restrictions for the portion of the RNA within the WSA would continue to apply whether or not the area was designated wilderness.

The Oregon Department of Fish and Wildlife (ODFW) maintains several wildlife guzzlers (small wildlife watering devices) which have been constructed in this WSA. Access to these guzzlers is necessary at least twice a year to maintain them.

ODFW has also identified the Lone Mountain area as having suitable habitat for bighorn sheep. They have proposed to release sheep in the area sometime before 1987 as part of a program to reintroduce bighorns to their former range. The Lone Mountain site is one of six proposed locations for release of bighorns and ranks fourth on ODFW's priority list within the BLM's Burns District.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- the WSA's habitat for bighorn sheep;

- proposed development of livestock improvement projects;

- potential mineral exploration and development; and

- existing motor vehicle access for maintenance of wildlife projects, particularly effects on maintenance costs of eliminating this access under wilderness designation.

Also raised as an issue was the possibility of combining the Rincon WSA with the three adjacent study areas to form one large wilderness area.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- partial (preferred alternative)
- no wilderness/no action

Closing the boundary roads and combining the Rincon area with one or more of the adjacent study areas is not analyzed in the enhanced wilderness alternative. All of the boundary roads which surround the Rincon WSA provide access for livestock operators, recreationists, BLM personnel, and private landowners. These are important access routes to areas where access is minimal and closing the roads is not feasible.

All Wilderness

Under the all wilderness alternative, all 97,545 acres of public land in the WSA would be recommended suitable for wilderness (see map 2). For purposes of analysis, it is assumed that none of the split-estate or private land in the study area would be acquired and the four dead-end roads which enter the area would remain open.

Enhanced Wilderness

Under the enhanced wilderness alternative, all 97,545 acres of public land in the WSA would be recommended suitable for wilderness (see map 3). Also, an attempt would be made to acquire 6,740 acres of split-estate and private inholdings and adjacent split-estate parcels. These parcels could be acquired through purchase or exchange with willing landowners; they would include two parcels of private land (120 acres) and 13 parcels of split-estate land (6,620 acres).

Assuming acquisition of these parcels, total area recommended suitable under this alternative would be 104,285 acres. The 13.5 miles of dead-end roads which enter the WSA would be closed.

Only minor boundary adjustments resulting from the land acquisitions would occur under this alternative.

The enhanced wilderness alternative would improve the manageability of the Rincon WSA by eliminating the possibility of development of minerals and the need for access to the private and split-estate parcels within the study area. The road closures would improve opportunities for solitude and primitive recreation by eliminating or substantially reducing vehicle use in the area. A limited amount of vehicle use by livestock operators would be allowed if there were no practical alternative to the use of vehicles for maintenance of grazing facilities or management of livestock.

Partial (Preferred Alternative)

The partial alternative would recommend 19,000 acres of public land in the WSA suitable for wilderness designation (see map 4). Also, an attempt would be made to acquire approximately 1,500 acres of split-estate inholdings in four parcels, through purchase or exchange with willing landowners.

Assuming acquisition of these parcels, total area recommended suitable under this alternative would be 20,500 acres. The remaining 78,545 acres of the WSA would be recommended nonsuitable for wilderness.

Boundary adjustments under this alternative would be made along the eastern and southern portions of the area. While the northern and northwestern boundaries remain the same (following the Long Hollow County road and the Funnel Canyon road, respectively), the northeastern boundary of the wilderness in this alternative would follow legal subdivisions. Approximately 6,000 acres in the northeast corner of the WSA would be recommended as nonsuitable for wilderness. This would exclude from the suitable area several reservoirs, ways (vehicle routes established and maintained solely by the passage of vehicles), and two dead-end roads.

The area would be recommended as nonsuitable because of the effects these developments have on the visitor's perception of naturalness within this part of the WSA. In addition, vehicular activity on roads leading to the developments would have an adverse effect on the opportunities for solitude in the area.

The southeastern boundary of the wilderness under this alternative would again follow part of the study area's boundary along a road from Mahogany Point to the south side of the section north of Coyote Hole Reservoir. From this point the boundary turns to the west to form the southern boundary. This portion of the boundary follows a combination of legal subdivisions, an elevation contour (5600 ft), and a small drainage which cuts through the southern portion of Catlow Rim and intersects with the Funnel Canyon road.

The land to the south and east of this boundary (over 72,500 acres) would be recommended as nonsuitable for wilderness in this alternative because of: conflicts with other resources (potential minerals), and proposed range and wildlife improvements; the effects of a number of existing range developments, roads and vehicle ways on the area's naturalness and opportunities for solitude; and the need to use vehicles to maintain grazing facilities. The range developments and roads and ways in this part of the WSA are located just southeast of the suitable portion of the study area and northeast of the Lone Mountain area.

Land uses which probably would occur in the area not recommended as suitable for wilderness would be the same as those under the no wilderness/no action alternative. Mineral exploration and development may occur in the undesignated portion, since it includes areas identified as having moderate favorability for the occurrence of metals and diatomite.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- implementation of proposed livestock improvement projects, including brush control and seeding, fencing, and several water developments;
- implementation of proposed wildlife improvement projects, including 3 guzzlers and a 6,000-acre burn; and
- continued availability for mineral exploration and development.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Table 1. Summary of Proposed Management Under Each Alternative, Rincon WSA (OR-2-82)

Proposed Management	All Wilderness	Enhanced	Partial Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	97,545	97,545	19,000	0
Acres Closed to ORVs by Wilderness Designation	97,545	97,545	19,000	0
Miles of Roads Closed	0	13.5	0	0
Miles of Ways Closed	49	49	4	0
Acres of Full Fee Estate Acquired [1]	0	120	0	0
Acres of Split Estate Acquired [1]	0	6,620	1,500	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	97,545	97,545	19,000	0
Structural Wildlife Projects Developed: Catchments & Guzzlers (number)	0-3	0-3	3	3
Vegetative Manipulation for Livestock: Brush Control without Seeding (acres)	0	0	6,000	6,000
Structural Livestock Projects Developed:				
Reservoirs & Waterholes (number)	0-3	0-3	3	3
Springs (number)	0-2	0-2	2	2
Pipelines (miles) [2]	0-25	0-25	23-25	25
Fences (miles)	0-23	0-23	22-23	23
Storage Tanks (numbers)	0-2	0-2	1-2	2
Vegetative Manipulation for Wildlife: Brush Control with Seeding (acres)	0	0	2,230	2,230

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

[2] Includes installation of three "bottomless" troughs.

Manageability of the Area as Wilderness

Under the all wilderness alternative, the area would be manageable as wilderness. Manageability problems could occur due to the presence of a number of inholdings including scattered parcels of split-estate land and two small parcels of private land. These problems would be associated with possible development of the inholdings and the need for access.

Although no development is planned for any of the parcels at this time, both private parcels and one section of split-estate land are within an area with

Table 2. Summary of Environmental Consequences of Alternatives, Rincon WSA (OR-2-82)

Resource or Activity	All Wilderness	Enhanced Wilderness	Partial (Preferred Alternative)	No Wilderness/No Action
Wilderness Values	Would add 97,545 acres to the NWPS. Maintains the present or improved level of quality for wilderness characteristics and protects the area's special features. It includes an area of geologic, wildlife (raptors) and scenic values associated with the escarpment along Catlow Rim, the scenic rock outcroppings and rugged topography of Lone Mountain and the vast open expanse of the area around Oregon End Table. Closure of 49 miles of vehicle ways would enhance naturalness. Although minor manageability problems occur due to inholdings, the area is manageable as wilderness.	Would add 104,285 acres to the NWPS, assuming acquisition of 6,740 acres of private and split-estate land. Includes all of the features identified in the all wilderness alternative. Road closures and acquisitions improve manageability of the area over all wilderness alternative. Closure of 17.5 miles of dead-end roads and 49 miles of ways would enhance wilderness values.	Adds 20,500 acres to the NWPS, assuming acquisition of 1,500 acres of split estate. The area recommended as suitable includes the northern end of the WSA along the Catlow Rim. This alternative maintains wilderness characteristics and special features found in this area at their present or improved level of quality. Suitable area is manageable as wilderness. Closure of 4 miles of ways would enhance wilderness values. Some 78,545 acres, including the Lone Mountain area and Oregon End Table would be recommended nonsuitable for wilderness. Wilderness values would not be maintained in this part of the WSA. This area would be managed for multiple uses other than wilderness. In the nonsuitable area, exploration and development of energy and mineral resources as well as the development of proposed livestock and wildlife improvements could adversely affect wilderness values.	Wilderness values and special features would be subject to possible disturbance from the development of proposed range improvements and development of energy and mineral resources.
Energy and Mineral Development	Development precluded on 97,545 acres, including 97,545 acres with moderate potential for metals and 25,834 acres with moderate potential for diatomite.	Same as all wilderness, except development precluded on an additional 6,740 acres if private and split-estate land is acquired.	Development precluded on 19,000 acres, plus an additional 1,500 acres if split-estate is acquired. Includes 19,000 acres with moderate potential for metals. All moderate potential diatomite is outside of the area recommended suitable.	No impact.
Vegetation	Vegetation preserved. No additional impact unless water developments allowed. If allowed, cattle redistribution could alter vegetation composition and maintain communities at mid-seral stage.	Same as all wilderness alternative.	Vegetation preserved in suitable area. In the nonsuitable portion, vegetative manipulations on 2,230 acres and increased grazing made possible by water developments could reduce vegetation diversity in the burn-and-seed and change vegetation; the ONHP species of special interest would be subject to disturbance unless designated a BLM-sensitive species.	Same as nonsuitable area in partial alternative.
Wildlife	Wildlife habitat preserved. Eight guzzlers subject to deterioration due to increased maintenance expense possibly leading to a reduction in numbers of certain species. Opportunity to improve wildlife habitat for antelope with a 6,000-acre burn would be foregone along with possible benefits to antelope from a proposed livestock seeding. Three proposed guzzlers designed to improve habitat by providing additional water might or might not be developed. Benefits to wildlife from other proposed livestock projects might or might not be foregone.	Same as all wilderness alternative.	Wildlife habitat preserved in suitable area. Increased availability of water to some species due to addition of range improvements and three proposed guzzlers. A 6,000-acre burn in non-suitable area would improve habitat for antelope. Increased numbers of antelope and possibly some other species could result from these improvements. Increased number of antelope and possibly some other species also would result from proposed livestock projects, most of which would be allowed under this alternative.	Range improvements would benefit some species by increasing the availability of water. Proposed wildlife improvements would be developed, perhaps increasing some species populations. Antelope numbers expected to increase by 80.
Livestock Grazing	Proposed brush control and seeding would not be allowed, structural projects might or might not be allowed. This could result in foregoing production of livestock forage which would offset a possible reduction of up to 2,642 AUMs of licensed use in the allotment. There would be no significant impacts on livestock management from closure of vehicle ways.	Same as all wilderness alternative, except closure of four dead-end roads used for livestock management could have moderate adverse impact on livestock operators.	Proposed livestock improvements would be allowed in area recommended nonsuitable. Some structural projects might or might not be allowed. A reduction of up to 1,207 AUMs of licensed use in allotment would be possible without these projects (92 AUMs in Rincon WSA and 1,115 AUMs in Basque Hills WSA). There would be no significant impact to livestock management with the closure of vehicle ways in the suitable area.	All proposed range improvements would be permitted, producing forage which would contribute 2,955 AUMs toward forestalling a possible 4,000 AUM decrease in licensed use allotment wide (1,840 AUMs in Rincon WSA and 1,115 AUMs in Basque Hills WSA).

Table 2. (continued)

Resource or Activity	All Wilderness	Enhanced Wilderness	Partial (Preferred Alternative)	No Wilderness/No Action
Recreation Use	Use of motorized vehicles for recreation would be restricted to four dead-end roads. Some net reduction in overall recreation use as a result of prohibiting vehicle use of ways. Slight increase in recreation use could occur depending on the number of range improvements allowed. Most recreation in WSA is related to hunting.	Vehicle-oriented recreation would be eliminated as a result of this alternative. Slight increase in recreation use could occur depending on the number of range improvements allowed. Net reduction in overall recreation use as primitive recreation use would not increase sufficiently to offset loss of vehicle-oriented recreation.	Vehicle use allowed in areas recommended nonsuitable for wilderness. No significant change in recreation use as a result of vehicle way closure within suitable area. Quality of primitive recreation reduced in area recommended nonsuitable.	Existing vehicle-oriented recreation would continue. Primitive recreation would be subject to disturbance by other activities. Increased vehicle-oriented activities, including hunting, many occur as a result of increased wildlife populations due to development of livestock improvements.
Economic Value and Local Income	Decrease in annual economic value of $22,115 to $22,281 depending on what proposed projects would be allowed in wilderness. Local personal income would decrease by $64 to $24,733 depending on the same uncertain factors. Both sets of figures exclude unknown economic effects of mineral development and unquantified changes in recreation use.	Decrease in annual economic value of $22,115 to $22,281 depending on what proposed projects would be allowed in wilderness. Local personal income would decrease by $64 to $24,733, depending on the same uncertain factors. Both sets of figures exclude unknown economic effects of mineral development and unquantified changes in recreation use. The maximum increase in transportation costs to ranchers with grazing permits would be $1,506.	Decrease in annual economic value of $22,089 to $25,214, depending on what proposed projects would be allowed in wilderness. Local personal income would either decrease by $6,377 or increase by $5,153 depending on the same uncertain factors. Both sets of figures exclude unknown economic effects of mineral development and unquantified changes in recreation use.	Decrease in economic value by $22,089 and increase in local personal income by $5,153 from construction of proposed projects.

moderate favorability for occurrence of metals near Lone Mountain. Other split-estate sections are also within areas of moderate favorability for metals and diatomite.

The areas under both the enhanced wilderness and the partial (preferred) alternatives are manageable as wilderness.

Rationale for Selection of the Preferred Alternative

The partial alternative is preferred for a number of reasons. The area recommended as suitable for wilderness contains most of the southern end of Catlow Rim. This area is in a basically natural condition and has outstanding opportunities for solitude and primitive types of recreation. It also contains special features, including cultural resources, high-quality raptor habitat and an area of geological interest.

Designation of this portion of the study area as wilderness would protect the area's wilderness values and special features within an area which is capable of being managed to preserve these qualities.

This portion of the study area has only minor conflicts with other resource uses. Like the rest of the WSA, this portion has been identified as having low favorability for the occurrence of oil and gas and moderate favorability for the occurrence of metals. Parts have moderate favorability for diatomite. The range improvements which have been proposed for the study area would affect only a small part (southern end) of the area recommended suitable for wilderness.

The wilderness values found in the area recommended as suitable outweigh the possible conflicts with other resources.

Some 78,545 acres of the Rincon wilderness study area are recommended as nonsuitable for wilderness designation under this alternative because of the potential mineral values in the area, the inconvenience and cost of maintaining range improvements without the use of vehicles, the benefits to be gained from improving wildlife habitat, and the adverse influence of existing livestock facilities on naturalness and solitude.

The portions of the study area recommended nonsuitable under the partial alternative include part of the northeastern corner of the WSA's panhandle, the area around and including Lone Mountain, and the land to the east of Lone Mountain including Oregon End Table.

Within the nonsuitable portions are two pockets of the WSA which have a greater concentration of range developments than the remainder of the area. These pockets occur in the northeast and in the east-central parts of the study area and have an adverse affect on naturalness in those portions of the WSA. Opportunities for solitude in the areas with concentrated range improvements would also be reduced by maintenance and livestock management activities at and around the developments.

Portions of the study area recommended nonsuitable for wilderness have moderate favorability for the occurrence of diatomite. Like the rest of the WSA, all of the nonsuitable area has a moderate favorability for the occurrence of metals; but it also includes the Lone Mountain portion of the study area, which has been singled out as having a greater amount of evidence to support the metals classification than the remainder of the study area.

Affected Environment

This section discusses only those activities or resources which influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Rincon WSA appears to be in a relatively natural condition. None of the man-made developments within the study area is substantially noticeable and most of them can be seen from only a very small portion of the WSA. With the exception of two areas where these developments are somewhat concentrated, a visitor to the study area would not feel that people had had a significant impact on the natural quality of the WSA.

The Rincon WSA contains 70 man-made developments. Of this total, 35 are water developments for livestock or wildlife, including 25 reservoirs, 8 wildlife guzzlers and 2 spring developments. Thirty-two of the developments are vehicle ways totaling approximately 49 miles. One of the developments is an old mining prospect, and the 2 other developments are fences, including the district boundary fence.

Approximately 7 percent of the study area is influenced by these features. (The area of influence is an estimate of the acreage within the WSA from which each of these man-made features can be seen.)

The area affected by water developments accounts for less than half of the total area influenced by man-made features. Most of the water developments occur in two general locations: the northern part of the panhandle and the central portion to the north and east of the Lone Mountain area. Several other water developments are scattered around the perimeter of the study area.

Individually, most of these water developments influence a relatively small area. Many of the reservoirs are located in shallow drainages and can be seen from only the immediate vicinity of the drainage. Other developments, including several of the guzzlers, are located on hillsides facing away from higher terrain, thus limiting the area from which they can be viewed.

A large reservoir located in the north end of the WSA, a guzzler, a group of two reservoirs, and several segments of vehicle ways located in the southwest corner are within fairly wide valleys. Because of their location, they influence a larger acreage than the majority of the water developments.

Three other water developments also influence a fairly large area due to their location below Catlow Rim (two along the northern boundary and one along the western boundary). Because of their location low on the steep slope of the rim, they are visible from much of the higher terrain.

The area from which the 32 vehicle ways can be seen accounts for about half of the area influenced by man-made features. As with most of the reservoirs, the ways are located in the northern and central portions of the WSA and individually have a very small influence on the WSA as a whole. The remaining two developments, a fence and an old mining site, have little influence on the area.

The most noticeable outside sights and sounds are the roads which form the boundary of most of the area; they are easily visible from the WSA's perimeter. These roads represent a visual contrast which is noticeable but not significant enough to detract from the natural appearance of the WSA. Other outside sights have a very minor influence on the WSA. These features include two crested wheatgrass seedings, a ranch, a cow camp, and several small water developments.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude in the Rincon WSA are outstanding. These opportunities are enhanced by the area's large size and diverse topography, particularly the rolling hills found within much of the area, the rugged rock outcroppings around Lone Mountain, and the rims and elevation differences associated with Catlow Rim and Oregon End Table. The only vegetative screening is the western juniper on the south side of Lone Mountain around Juniper and Granite Springs. For the WSA as a whole, vegetative screening does not enhance opportunities for solitude.

The area provides outstanding opportunities for primitive forms of recreation, including day hiking, camping, backpacking, horseback riding, hunting, observing wildlife, sightseeing, and photography.

Opportunities for day hiking within the Rincon WSA are very good. Primary attractions of the area would be Catlow Rim and the Lone Mountain area. Several of the steep drainages which cut into Catlow Rim provide challenging access to the top of the rim. The rock outcroppings around Lone Mountain would be of interest and would also present a challenge to the hiker. Other features which might be of interest to a hiker include Oregon End Table and the small canyons along the southern boundary which drain into Long Draw.

These features would also be of interest to a backpacker or horseback rider. Most of the terrain has abundant level areas suitable for camping. The limiting factor for overnight stays is the availability of water.

Game species which can be hunted within the area include mule deer, antelope, and chukars. The northern end of the WSA is particularly good for deer, while the opportunities for chukar hunting are best along the Catlow Rim. Opportunities for antelope hunting are only fair due to the low number of animals within such a large area.

Opportunities for observing wildlife (especially raptors along the Catlow Rim), sightseeing, and photography are also good within the WSA. The areas around Catlow Rim, Lone Mountain, Oregon End Table and various other points around the WSA would all provide good opportunities for sightseeing and photography. Broad vistas with views of surrounding topography are available throughout most of the study area, while the rock forms around Lone Mountain, the rugged face of Catlow Rim, and other features provide interesting views and photographic settings within the area.

Special Features

There are several features within the Rincon WSA which add to the value of the area as wilderness, including wildlife, geologic, cultural and vegetative features.

Wildlife is a special feature within this study area because of the high-quality raptor nesting area and because of an area of crucial antelope winter range. The raptor area includes the northern fifteen miles of Catlow Rim within the WSA. This is the southern end of a 31-mile-long area identified by the U.S. Fish and Wildlife Service in its February 1980 publication, "Important Fish and Wildlife Habitat of Oregon". The importance of the area is largely due to the high density of raptor species using the area.

The crucial antelope winter range is located in the southeastern portion of the WSA and includes most of the Oregon End Table area. The study area also includes potential habitat for bighorn sheep in the Lone Mountain area. Kit fox, on the Oregon Department of Fish and Wildlife's (ODFW) List of Threatened Species, may range into lower elevations in the south end of the WSA.

The geology of the WSA is a special feature mainly because of Catlow Rim. Catlow Rim is a prominent fault scarp which forms the western edge of the southern topographic unit of the Steens Mountain Fault Block. In addition, the rim also serves as the eastern boundary of Catlow Valley, a prominent structural basin or tectonic depression. This basin or depression, especially along Catlow Rim, is characterized by ancient shoreline features such as gravel bars, spits, wave-built terraces and wave-cut benches which are obvious evidence of a lake that occurred in Catlow Valley during the Pleistocene glacial period.

Catlow Rim has also been identified as a geological sightseeing area because of its uniqueness and size.

Cultural resource sites in the WSA include a well-known cave and an area with a considerable amount of rock art. The cave was the focus of a pioneering archeological study in this part of Oregon. The rock paintings and carvings are located in a little studied part of the state. (See the Cultural Resources section for more information.)

There is one plant species of special interest in the WSA, *Phacelia gymnoclada*. (See the Vegetation section for additional information.)

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the Rincon WSA is located in the Intermountain Sagebrush Province and the potential natural vegetation is sagebrush steppe.

The Oregon Natural Heritage Plan identifies seven ecosystems which occur in the Rincon WSA. They are big sagebrush/bluebunch wheatgrass, Indian ricegrass-needlegrass community, big sagebrush/spiny hopsage, big sagebrush-bitterbrush with Idaho fescue, low sagebrush/Idaho fescue, big sagebrush/Idaho fescue, and a black sagebrush community complex within the Basin and Range physiographic province.

The study area is within 5 hours' driving time of two standard metropolitan statistical areas with populations over 100,000: Boise, Idaho, and Reno, Nevada.

Energy and Mineral Development

The geology, energy, and mineral resources of the Rincon WSA were evaluated by interpreting existing literature, reviewing past and present mining claims and mineral leasing records, and correlating rock units in the WSA with similar environments in other areas that are known to contain mineral deposits. Technical details of the findings of the evaluation are in a report of the assessment of mineral resources in Catlow Rim Geologic Resource Area (GRA OR-021-22), Harney County, Oregon, prepared by TERRADATA, a BLM contractor, and in a BLM report on the assessment of mineral resources in the South Harney Geologic Resource Area.

The WSA is within the geologic resource area, which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA has been rated moderately favorable for the occurrence of metals. However, a portion of the moderate rating for metals, in the Lone Mountain area of the WSA, has a higher confidence level (3B) than the rest of the study area (rated 3A). This area is analogous to the geologic environment found in the Pueblo and Steens Mountains where hydrothermal deposition of copper, mercury, and accessory gold has been found in silicified fault zones.

Portions of the WSA are rated moderately favorable for the occurrence of diatomite. There are numerous tuffaceous sedimentary beds (both flood plain and lake deposit) within the WSA where diatomite occurrences have been reported during geologic mapping. Similar geologic units in Tertiary basins of southeastern Oregon contain diatomite deposits.

Table 3 shows the mineral potential classifications for Rincon WSA. Map 5 shows the portion of the WSA rated moderate (medium) for diatomite and the portion rated moderate (with a confidence level of B) for metals.

Mercury and copper are strategic and critical minerals with moderate potential for occurrence in the area; but no strategic and critical mineral deposits are known to exist in the WSA.

The surface rocks are composed mainly of Tertiary, volcanically derived units which fall into three general age groups. The oldest group is composed of: Miocene Steens basalt flows; locally occurring andesite and basalt flows with minor interbeds of tuffaceous sedimentary rocks and tuffs; welded tuffs; and tuffaceous sedimentary rocks and tuffs of the Trout Creek formation.

Table 3. Classification of Energy and Mineral Potential, Rincon WSA (OR-2-82)

Commodity	Area	Classification Level	Confidence Level
Metals (copper, mercury, gold)	See map 5	3	B
	Rest of WSA	3	A
Geothermal	Part of area (not shown on map 5)	2	B
	Rest of WSA	1	B
Uranium/Thorium	Entire WSA	1	A
Coal	Entire WSA	2	C
Oil/Gas	Entire WSA	2	B
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	A
Bentonite	Entire WSA	2	A
Diatomite	See map 5	3	A
	Rest of WSA	2	B
Zeolites	Entire WSA	1	A

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

The second group of rocks consists of Pliocene, lacustrine (lake) deposit tuffaceous sandstone, siltstone, ashy diatomite, and interbedded flows of basaltic and andesitic composition.

The youngest rocks consist of Quaternary volcanic domes and flows of rhyodacitic composition, composite volcanoes composed of basalt and andesite, pyroclastic rocks from basaltic cinder cones, a few dikes and sills of basaltic or gabbroic composition, and alluvial deposits of gravel, silt and sand.

Aside from abundant road aggregate sources, there are no known mineral deposits in the Rincon WSA. As of January 1, 1984, there were no mining claims within the study area and no geothermal or oil and gas leases.

Vegetation

The major vegetative communities in the Rincon WSA are big sagebrush/bunchgrass communities. On the uplands with little or no slope, the major species are big sagebrush, Thurber's needlegrass, Sandberg's bluegrass, squirreltail, cheatgrass, and, in Fields Basin, bitterbrush. The steeper south slopes have bluebunch wheatgrass as the dominant grass. On the north slopes, the primary species include Idaho fescue, bluegrasses, big sagebrush, and snowberry.

Most of the big sagebrush communities are estimated to be in mid-seral stage, especially areas with little or no slope. The steeper slopes are estimated to be late seral. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) The major climax species on the uplands and south slopes are bluebunch wheatgrass, big sagebrush, and bitterbrush where it occurs. On the north slopes, the climax species are Idaho fescue, big sagebrush, and snowberry.

A low sagebrush community occurs in areas which are flat, rocky, and have shallow soils. The current successional stage is estimated to be mid to late seral. The climax vegetation is mainly low sagebrush and Idaho fescue.

On Oregon End Table, there is a black sagebrush community. The current successional stage is mid to late seral. The climax vegetation is black sagebrush and Sandberg's bluegrass.

One small but unique area containing western juniper occurs on the southwest side of Lone Mountain near Granite Spring. The species commonly found include western juniper, mountain mahogany, big sagebrush, several species of bluegrasses, needlegrass, bluebunch wheatgrass and a variety of forbs.

The area is unique due to the presence of juniper. The juniper grows on and around the columnar rock outcrops. No other juniper stands occur in this portion of the district. The nearest stands are in the Steens Mountain area 15 miles to the north and the Pine Forest Mountains 20 miles to the south. The successional stage of this area is not known but probably is late seral with the primary climax vegetation being western juniper, big sagebrush and bunch grasses.

A plant species of special interest known to exist within the study area is *Phacelia gymmoclada* (thick-leaved phacelia). This plant is on List 2 of the Oregon Natural Heritage Plan's 'Rare, Threatened and Endangered Plants and Animals of Oregon.'

Wildlife

The Rincon WSA provides habitat for wildlife species using the big sagebrush, low sagebrush, and antelope bitterbrush habitats. Cliffs and rugged canyons provide additional habitat for many species.

Mule deer summer throughout the WSA, but numbers are relatively low. The distribution of springs, reservoirs and other water sources is fair, but many areas have no water.

Antelope winter in the southern part of the WSA and summer where low sagebrush flats have adequate water. Some winters, over 2,000 antelope stay near Big Springs Table (mostly in Nevada), but move onto Oregon End Table in the southeastern portion of the study area. This part of the study area has been identified as crucial antelope winter range.

Four usually active eagle nests and six usually active prairie falcon nests are on Catlow Rim above Long Hollow and overlooking Catlow Valley on the northwestern side of the study area. Fourteen other inactive golden eagle nests have been located in the WSA. American kestrels, great-horned owls, long-eared owls, red-tailed hawks, and common raven are other raptors using the area.

Sage grouse are found throughout most of the WSA. One sage grouse strutting ground has been located on Oregon End Table. Chukars are found where steep rocky rims occur. They are usually abundant on the northern end of the WSA near Long Hollow, the west edge of the study area above Catlow Valley, and the south side of Lone Mountain. Valley quail are occasionally observed, but are not abundant. Rincon Reservoir, on the southeastern edge of the WSA, is used by migrating waterfowl (up to 200) during the spring through fall.

Kit fox, on the Oregon Department of Fish and Wildlife's (ODFW) List of Threatened Species, may range into lower elevation habitat in the south end of the WSA.

Other wildlife species common to the WSA include western rattlesnake, common flicker, sage sparrow, Brewer's sparrow, horned lark, rock wren, sage thrasher, least chipmunk, antelope ground squirrel, black-tailed jackrabbit, mountain cottontail, kangaroo mouse, Great Basin pocket mouse, canyon mouse, bushy-tailed woodrat, coyote, and small-footed myotis (bat).

ODFW has proposed reintroducing California bighorn sheep on the south side of Lone Mountain. Bighorns were native to most of southeastern Oregon, including the WSA.

Eight guzzlers have been installed on Lone Mountain and west of Catlow Rim. These structures are maintained twice annually by ODFW.

Proposed wildlife developments include construction of three guzzlers in the area north of Lone Mountain in the central portion of the WSA and a 6,000-acre burn northeast of Lone Mountain. The burn is intended to create additional habitat for antelope, while the guzzlers are intended to aid a variety of wildlife species by providing additional water sources.

Livestock Grazing

Portions of three grazing allotments are within the Rincon WSA: Pueblo-Lone Mountain and South Steens Allotments in the Burns District and Beatys Butte Allotment in the Lakeview District. Table 4 summarizes livestock use in the area in AUMs (animal unit months, the amount of forage needed to sustain one cow and a calf, or equivalent animals, for one month).

The proposed range improvements within the WSA include 2,230 acres of brush control and seeding with crested wheatgrass, 25 miles of pipeline, 23 miles of fence, two springs, two reservoirs, one waterhole, two 18,000-gallon storage tanks and three 10,000-gallon bottomless troughs. The proposed crested wheatgrass seeding would be next to an existing seeding not in the WSA.

The projects would primarily provide water in areas where there is available forage that is not being efficiently used by livestock due to lack of water. All of the projects would allow better distribution of livestock and increase available forage in the WSA. These improvements would increase forage in the WSA portion of the Pueblo-Lone Mountain allotment. The projects are part of a total allotment plan affecting portions of the adjacent Pueblo Mountains, Hawk Mountain and Basque Hills WSAs. The 4,000 AUMs produced by projects throughout the allotment would not result in increased licensed use, but they would be used to offset possible reductions of 4,000 AUMs allotment-wide (3,800 of which is within the 4 WSAs).

Existing livestock developments (among the man-made features mentioned in the Naturalness

Table 4. Existing and Potential Livestock Use, Rincon WSA (OR-2-82)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. of WSA	Current Actual Use in WSA (AUMs)	Potential Decrease in WSA (AUMs)
Pueblo-Lone Mt (No. 6020)	19,329	04/16 - 10/31	32	8,940	1,840
South Steens (No. 6002)	21,935	4/16 - 2/28	2	370	0
Beatys Butte (No. 0600)	27,892	6/16 - 09/30	0.5	180	0
Totals	69,156			9,490	1,840

section) include 25 reservoirs and 2 spring developments. Grazing operators use vehicles extensively in and along the boundary of the WSA for monitoring livestock, hauling horses and salting. Horses are used for gathering and managing livestock.

Cultural Resources

Catlow Cave is located in the northwestern portion of the WSA along the Catlow Rim. Excavated in the 1930's by Luther Cressman, this was a major 'Early Man' site located along ancient Lake Catlow.

There is substantial and important rock art in the southern portion of the WSA, by the Oregon End Table. These include paintings (pictographs) and carvings (petroglyphs) on Rimrock and boulders, which may be associated with 'hunting magic.' These sites are generally undocumented but are well-preserved.

Recreation Use

Recreation use in the Rincon WSA is primarily oriented toward hunting. Mule deer, antelope, and chukar are the most commonly hunted game species. It is estimated that deer hunting accounts for moderate use while antelope hunting amounts to low use.

While antelope hunting is scattered throughout the WSA, deer hunting is concentrated in the northern portion of the WSA with some use in the Lone Mountain area. Both deer and antelope hunters use vehicles as their primary access into the area; they use both dead-end roads and vehicle ways in getting to their destination.

Chukar hunters, on the other hand, generally hike into the area leaving their vehicles along the boundary road. This is because the road along the area's western boundary is close to the chukar hunting area (along Catlow Rim). Moderate visitor use is attributable to chukar hunting.

Off-road use of vehicles is not common within the WSA.

The study area currently receives little primitive recreation use not associated with hunting. The area receives low primitive recreation use, such as day hiking, backpacking, or general sightseeing and wildlife viewing.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. The WSA currently produces 9,490 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually. As of January 1, 1984, there were no oil and gas or geothermal leases on the WSA.

The economic value of existing outputs amounts to $71,555 annually, and local personal income generated by existing outputs amounts to $79,147 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 97,545 acres to the National Wilderness Preservation System (NWPS). The area contains three prominent physical features whose wilderness qualities would be protected under this alternative, including the southern end of Catlow Rim. The fifteen-mile segment of the rim in the northern portion of the study area is a rocky-faced, 1,800-foot-high escarpment, cut by intermittent streams in short, steep-walled canyons. It is noted for providing outstanding raptor habitat.

Wilderness designation under this alternative would preserve the wilderness values of Lone Mountain, a gently rising mountain characterized by scenic rocky outcrops and the highest point in the study area, and Oregon End Table, a relatively flat plateau edged by rimrock. Low, rolling, sagebrush-covered hills lie between all three of these features and cover most of the study area.

Designation of the area under the all wilderness alternative would protect the special wilderness features of the WSA in their present condition. This would include the raptor habitat and area of geologic interest along Catlow Rim, the crucial antelope winter range at Oregon End Table, the potential bighorn sheep habitat in the Lone Mountain area, cultural resource values and 3 plant species of special interest.

Wilderness designation under this alternative would maintain or improve the natural qualities of the area as well as the outstanding opportunities for solitude and primitive types of recreation. Closure of 32 vehicle ways totaling 49 miles would improve the naturalness of the area by eliminating most vehicle use and allowing the ways to revegetate.

The ways would continue to be used as necessary for maintaining existing livestock facilities, but this probably would be on a very limited basis. Closing the ways would also improve opportunities for solitude and improve the quality of primitive recreation by eliminating motor vehicles.

The scenic values of the area would also be maintained by precluding major developments within the WSA. Potential mineral development and proposed livestock or wildlife improvements would be restricted under the all wilderness alternative.

If minerals or other resources were developed on the inholdings or access routes were constructed across public lands to the inholdings, wilderness values in the surrounding wilderness would be impaired.

The **enhanced wilderness alternative** would add 104,285 acres to the NWPS, assuming the 6,740 acres of scattered split-estate and private lands within the WSA could be acquired. The effects of this alternative are similar to the all wilderness alternative. This alternative would eliminate the possibility of development of minerals on the inholdings, a possibility which could complicate management of the area as wilderness.

Closing the four dead-end roads (totaling 13.5 miles) in addition to 49 miles of ways would nearly eliminate vehicle use in the area and improve the manageability of the WSA by preventing the possibility of vehicle intrusion on solitude. The closure would also improve the natural quality of the area by allowing the roads to revegetate and become less noticeable.

The **partial alternative** would add 20,500 acres to the NWPS, assuming acquisition of the 1,500 acres of split-estate land.

Wilderness values (naturalness, solitude, recreation), and special features (wildlife and geology) as well as the scenic values which occur in the northern portion of the WSA, which includes Catlow Rim, would be preserved under this alternative. Overall, opportunities for solitude and recreation would be reduced and confined to an area which is less than one-quarter the size of the WSA. The kit fox habitat and crucial antelope winter range would not be included in the area recommended suitable for wilderness.

Closure of 4 miles of ways would enhance wilderness values.

Wilderness values in the 78,545 acres recommended nonsuitable, including those associated with the special features in this part of the study area (basically the Lone Mountain, Oregon End Table portions), would not be protected and could be subject to disturbance from other resource uses.

Proposed livestock and wildlife improvements would adversely affect the naturalness of the nonsuitable area since all proposed surface disturbing activities, such as construction of pipelines and reservoirs and vegetative manipulation projects (crested wheatgrass seedings and controlled burns) would be allowed. Other possible activities such as mining could further adversely affect the natural character of the area not recommended for wilderness.

Opportunities for solitude would be adversely affected in the area not designated as wilderness as a result of additional access and use of vehicles for new projects or possible mining operations. Primitive recreation values could be lessened by projects or mining activities, depending on their location and the extent of disturbance to recreation attractions.

The wildlife (bighorn sheep habitat and crucial antelope winter range) and botanical special features within this nonsuitable southern portion of the study area would also be subject to disturbance from development of other resources.

Under the **no wilderness/no action alternative**, the wilderness values and special features of the entire WSA would be subject to disturbance from any proposed developments as well as possible development of mineral resources. The impacts to specific wilderness values would be the same as those for the nonsuitable portion under the partial alternative.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development: 97,545 acres, under the **all wilderness alternative**; 97,545 acres, plus an additional 6,740 acres if private and split-estate lands are acquired, as proposed under the **enhanced wilderness alternative**; and 19,000 acres, plus an additional 1,500 acres if split-estate lands are acquired, as proposed under the **partial alternative**.

Included in withdrawals under the all and enhanced wilderness alternatives would be the acreage rated moderate for the occurrence of metals, which encompasses the entire WSA, and the 25,834-acre portion rated moderate for diatomite.

The area withdrawn under the partial alternative would exclude this area rated moderate for diatomite. It also would exclude the portion of the WSA with moderate potential and indirect evidence (3B) for metals, although it would include lands with moderate potential and no direct evidence (3A) for metals (see map 5).

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Vegetation

Areas designated wilderness would not be subject to most surface disturbing activities. Vegetation dependent upon the existing undeveloped environment would thus be maintained.

The area proposed for vegetative manipulation projects is in the portion recommended nonsuitable under the **partial and no wilderness/no action alternatives**. So, these projects would be developed under either of these alternatives.

The brush control and seeding on 2,230 acres would result in the removal of sagebrush from the sagebrush/bunchgrass community and the addition of crested wheatgrass, a non-native species, as the dominant component in that community. This would reduce vegetation diversity by temporarily eliminating shrubs and forbs and converting the area to crested wheatgrass.

The ONHP species of special interest would be subject to disturbance in areas recommended nonsuitable since it is not formally protected; however, this species could be designated as a BLM-sensitive species and, as such, would receive the same protection as federally listed threatened or endangered species. The effects of fire on the plant of special interest is not known.

The proposed water developments, including springs, pipelines, reservoirs and guzzlers, might or might not be allowed under the **all wilderness and enhanced wilderness alternatives** depending on a site-specific assessment of whether they would conform with Wilderness Management Policy. Under the partial alternative, they would be allowed because they are in the area recommended as nonsuitable, and they also would be allowed under the no wilderness/no action alternative.

These water developments would change current patterns of livestock distribution. This would have an effect primarily in the area near Oregon End Table and in Long Draw where, historically, cattle use has been light. Vegetative composition could change if areas are grazed at a more intense level than previously grazed. The rate of succession toward the late-seral stage would probably be lessened, and the communities would remain near the mid-seral level. There may be adverse impacts on the plant species of special interest from heavier grazing pressure.

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness. Habitat protection would be particularly important to the proposed reintroduction of bighorn sheep.

The **all wilderness alternative** could cause a reduction in the numbers of certain species, and may result in the loss of opportunities to improve habitat. Wildlife populations could be affected in the **all wilderness and enhanced wilderness alternatives** as a result of two factors:

First, under the all and enhanced wilderness alternatives, if maintenance crews were precluded from using vehicles in the wilderness, eight wildlife guzzlers would be abandoned or would require reconstruction to reduce maintenance by the Oregon Department of Fish and Wildlife. Routine maintenance of these structures, required twice each year, would be too costly if access were restricted to travel by foot or horseback. If maintenance were reduced and vehicles were precluded, the result would be a reduction in the availability of water for wildlife and a probable reduction in wildlife numbers. In this case, it would have to be determined whether the use of vehicles or the reduction in wildlife populations constituted the greater impairment of wilderness values.

Second, under the all and enhanced wilderness alternatives, the proposed 6,000-acre controlled burn designed to improve wildlife habitat would not be allowed and an opportunity to convert big sagebrush habitat to herbaceous cover and increase antelope numbers by 80 head would be foregone. Three guzzlers planned for the central portion of the area might or might not be allowed depending on a site-specific assessment of whether they conform with Wilderness Management Policy. If not allowed, an opportunity to increase the availability of water and subsequently improve habitat and wildlife numbers would be foregone. Proposed range improvements for livestock use which might or might not be developed under this alternative could also improve wildlife numbers by providing additional water.

The all and enhanced wilderness alternatives would not necessarily allow large increases in numbers of big game to occur in the study area even though there would be less hunting pressure due to a reduction in vehicle use. Because the game animals move to areas outside the WSA to winter, an increase above normal carrying capacity in animal numbers could be controlled by hunts in other locations.

Under the **partial alternative**, the proposed burn and construction of the three proposed wildlife guzzlers, which would be outside the recommended wilderness area, would improve habitat and increase antelope numbers by 80 head. Other wildlife populations may be increased. Seven of the eight existing guzzlers also would be outside the area recommended as suitable and maintenance on these structures would not be affected. Similarly the range improvements for livestock are generally located outside the suitable area. Possible increases in wildlife numbers as a result of all of these improvements could be realized under this alternative.

Effects under the **no wilderness/no action alternative** would be the same as the partial.

Effects on Livestock Grazing

Portions of the Rincon, Pueblo Mountains, Basque Hills, and Hawk Mountain WSAs are within the Pueblo-Lone Mountain Grazing allotment.

Rincon WSA is one of 4 WSAs located in the Pueblo-Lone Mountain allotment. Water developments are proposed in all four of the WSAs and fences and seedings are proposed in the Rincon and Pueblo Mountains WSAs. These projects would allow livestock use to shift from apparently overgrazed portions of the Rincon and Pueblo Mountain WSAs, and areas outside the WSAs, to areas with unused grazing capacity in all four WSAs.

Preliminary and inconclusive data show that grazing in portions of the allotment, including portions of the Rincon and Pueblo Mountains WSAs, could exceed the grazing capacity by 4,000 AUMs (approximately 19 percent of the total licensed grazing use in the allotment) while other portions of the allotment, involving much of the Rincon, Basque Hills and Hawk Mountain WSAs, are not grazed at all due to lack of water and fences to keep livestock confined to those areas. (The preliminary estimate of the amount of overgrazing is subject to refinement as the effects of livestock grazing in the two WSAs are monitored.)

The proposed fences, water developments and seedings are needed to implement the grazing system. Under such a system, pastures are developed and certain pastures are rested or deferred in cycles to allow the forage some relief from grazing during the critical growth period.

Under the **all and enhanced wilderness alternatives**, the proposed brush control and seedings would not be developed. The proposed structural developments might or might not be allowed, depending on a site-specific analysis of whether they conform with Wilderness Management Policy. If the structural projects in the Rincon WSA are not allowed, a proposed pipeline in the Basque Hills WSA would not be constructed since it depends on a water source in the Rincon WSA. If all of the proposed projects in the Pueblo-Lone Mountain allotment are not allowed, additional forage used to offset potential reductions in licensed use and implement a new grazing system would be foregone. Licensed use in the allotment could be reduced by up to 2,955 AUMs in the absence of all of the projects (1,840 in Rincon WSA and 1,115 in Basque Hills WSA.)

The proposed seeding project and all the structural projects have a benefit/cost ratio greater than 1:1.

Under the **partial alternative**, the proposed brush control and seeding and most of the structural projects would be allowed since they are outside the area recommended as suitable for wilderness. This would contribute 1,748 AUMs toward forestalling a possible reduction of up to 4,000 AUMs allotment-wide. Several projects within the area recommended suitable might or might not be allowed, depending on a site-specific analysis of whether they conform with Wilderness Management Policy. These include 2 miles of pipeline, 1 mile of fence and 1 storage tank in Rincon WSA and a pipeline proposed between Rincon and Basque Hills WSAs. If these projects are not allowed, additional forage used to offset potential reductions in licensed use and implement a new grazing system would be foregone. Licensed use in the allotment could be reduced by up to 1,207 AUMs (92 in Rincon WSA and 1,115 in Basque Hills WSA.)

Under the **no wilderness/no action alternative**, all of the projects proposed in the Rincon WSA and the proposed pipeline between Rincon and Basque Hills WSA would be allowed. Opportunities to produce forage through brush control and seeding and to make additional forage available would be realized. This would contribute 2,955 AUMs (1,840 AUMs in Rincon WSA and 1,115 AUMs in Basque Hills WSA) toward forestalling a possible reduction of up to 4,000 AUMs of licensed use allotment-wide.

Under the all wilderness alternative, closing of ways would not be a significant inconvenience to the operator. Under the enhanced wilderness alternative, closing the four dead-end roads within the WSA, as well as the ways, would make it inconvenient for the livestock operator to spread salt evenly within this portion of the Pueblo-Lone Mountain allotment. Under the partial and no wilderness/no action alternatives, the roads would remain available to the livestock operator.

Effects on Recreation Use

Under the **all and enhanced wilderness alternatives**, the quality of and opportunities for primitive types of recreation in the study area would be maintained at their present level or improved. Improvements in the quality of primitive recreation would be a result of eliminating vehicle use on ways under the all wilderness alternative and on roads and ways under the enhanced wilderness alternative.

The all wilderness alternative would generally reduce vehicle-oriented recreation, mostly hunting for deer and antelope. Chukar hunting would not be substantially affected because chukar hunters generally do not drive into the suitable portion. Some of the reduction in visitor days from vehicle-oriented hunting would be offset by increased use from hunters who do not use vehicles as a means of transportation within their hunting area.

Under the enhanced wilderness alternative, closing the dead-end roads which enter the WSA in addition to the closure of ways, would further reduce the impact of vehicle use on primitive recreation.

Because of vehicle restrictions in both the all and enhanced wilderness alternatives, it is expected that overall recreational use of the WSA would decline. Primitive recreation use is not expected to increase substantially under these alternatives. Any expected increase in primitive recreation use would not be sufficient to offset the reduction in vehicle-oriented recreation.

Under the **partial alternative**, opportunities for primitive types of recreation would be maintained in the northern portion of the WSA along the Catlow Rim. There would be no significant change in visitor use as a result of closing vehicle ways within the area recommended as suitable. Primitive recreation in the nonsuitable portion of the study area would be subject to a reduction in quality from developments. Proposed range improvements could have an adverse impact on primitive recreation. Developments in the Lone Mountain area would have the greatest impact on primitive types of recreation.

Vehicle-oriented recreation could be increased under the alternatives depending on the number of proposed developments allowed which may create additional access for vehicles. Similarly, hunting opportunities could be improved under all alternatives because the proposed wildlife and livestock improvements could increase some big game populations, and thus increase hunting opportunities. Increases in recreation use could be the greatest under the partial and no wilderness/no action alternatives.

Under the **no wilderness/no action alternative**, primitive recreation would continue to be subject to disturbance by proposed range improvement projects and existing vehicle access routes and use (although vehicle use for recreation or other purposes is not substantial in the area). Vehicle-oriented recreation could benefit from additional access provided by the development of range improvements.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 5 and 6. Table 5 shows the effects on economic value and table 6, the effects on local personal income. It is not known at this time whether individual proposed structural developments for this WSA would be constructed if the area were designated wilderness. It is known that vegetative manipulation projects, such as the

Table 5. Effects of Alternatives on Annual Economic Value, Rincon WSA (OR-2-82) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	Partial No Action	No Wilderness/
CHANGES IN RESOURCE OUTPUTS					
Grazing:					
Adjustments [1]	AUM	-2,955	-2,955	-2,955	-2,955
Investment [2]	AUM	0 to +2,642	0 to +2,642	+1,748 to +2,955	+2,955
Big game hunting [3]	RVD	0 to +277	0 to +277	+362 to +495	+495
Upland game hunting [3]	RVD	0 to +14	0 to +14	+7 to +14	+14
Fishing [3]	RVD	0 to +2	0 to +2	+2	+2
VALUE OF PLANNED INVESTMENTS [4]					
Grazing	$	0 to +19,921	0 to +19,921	-13,180 to +22,281	+22,281
Big game hunting	$	0 to +6,285	0 to +6,285	+8,214 to +11,232	+11,232
Upland game hunting	$	0 to +438	0 to +438	+219 to +438	+438
Fishing	$	+40	+40	+40	+40
Total [5]	$	0 to +26,684	0 to +26,684	+21,653 to +33,991	+33,991
Investments [6]	$	0 to -26,518	0 to -26,518	-24,586 to -33,799	-33,799
Net Economic Value	$	0 to +166	0 to +166	-2,933 to +192	+192
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS					
Grazing Adjustments	$	-22,281	-22,281	-22,281	-22,281
Reduced access [7]	$	0	-1,506	0	0
Total	$	-22,281	-23,787	-22,281	-22,281
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS					
All categories [8]	$	-22,281 to -22,115 (0)	-23,787 to -23,621 (-1,506)	-25,214 to -22,089 (0)	-22,089 (0)

[1] Adjustment for possible reduction in grazing is based on inconclusive data and may not be necessary.
[2] Expected future increases due to range improvement investments.
[3] Expected future increases from proposed livestock and wildlife projects.
[4] Vegetative manipulation projects involving up to $90,370 total expenditures, and a structural project involving up to $326,400. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[5] Detail may not sum to "Total" due to rounding.
[6] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.
[7] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.
[8] See footnote 1. If the grazing adjustment is found to be unnecessary, compensating improvements would not be developed. Investments and grazing adjustments would be zero. The effects of this case are shown in parentheses.

proposed burn to control sagebrush, would not be allowed.

The columns for the wilderness alternatives show the effects as a range of values dependent upon whether structural improvements, and/or grazing operator access, were allowed.

Vehicles are currently used for livestock management in the study area. The enhanced wilderness alternative would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $1,506 per year under the enhanced wilderness alternative.

Table 6. Effects of Alternatives on Local Personal Income, Rincon WSA (OR-2-82) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	Partial No Action	No Wilderness/
CHANGES IN RESOURCE OUTPUTS					
Grazing:					
Adjustments [1]	AUM	-2,955	-2,955	-2,955	-2,955
Investment [2]	AUM	0 to +2,642	0 to +2,642	+1,748 to +2,955	+2,955
Big game hunting [3]	RVD	0 to +277	0 to +277	+362 to +495	+495
Upland game hunting [3]	RVD	0 to +14	0 to +14	+7 to +14	+14
Fishing [3]	RVD	0 to +2	0 to +2	+2	+2
INCOME FROM PROPOSED INVESTMENTS [4]					
Grazing	$	0 to +22,113	0 to +22,113	+14,630 to +24,733	+24,733
Big game hunting	$	0 to +2,318	0 to +2,318	+3,595 to +4,915	+4,915
Upland game hunting	$	0 to +215	0 to +215	+108 to +215	+215
Fishing	$	0 to +23	0 to +23	+23	+23
Construction Activity [5]	$	0 to +43,992	0 to +43,992	+40,776 to +56,108	+56,108
Total [6]	$	0 to +24,669	0 to +24,669	+18,356 to +29,886	+29,886
INCOME FROM OTHER OUTPUT CHANGES					
Grazing Adjustments	$	-24,733	-24,733	-24,733	-24,733
INCOME FROM ALL OUTPUT CHANGES					
All categories [7]	$	-24,733 to -64 (0)	-24,733 to -64 (0)	-6,377 to +5,153 (0)	+5,153 (0)

[1] Adjustment for possible reduction in grazing is based on inconclusive data and may not be necessary.

[2] Expected future increases due to range improvement investments.

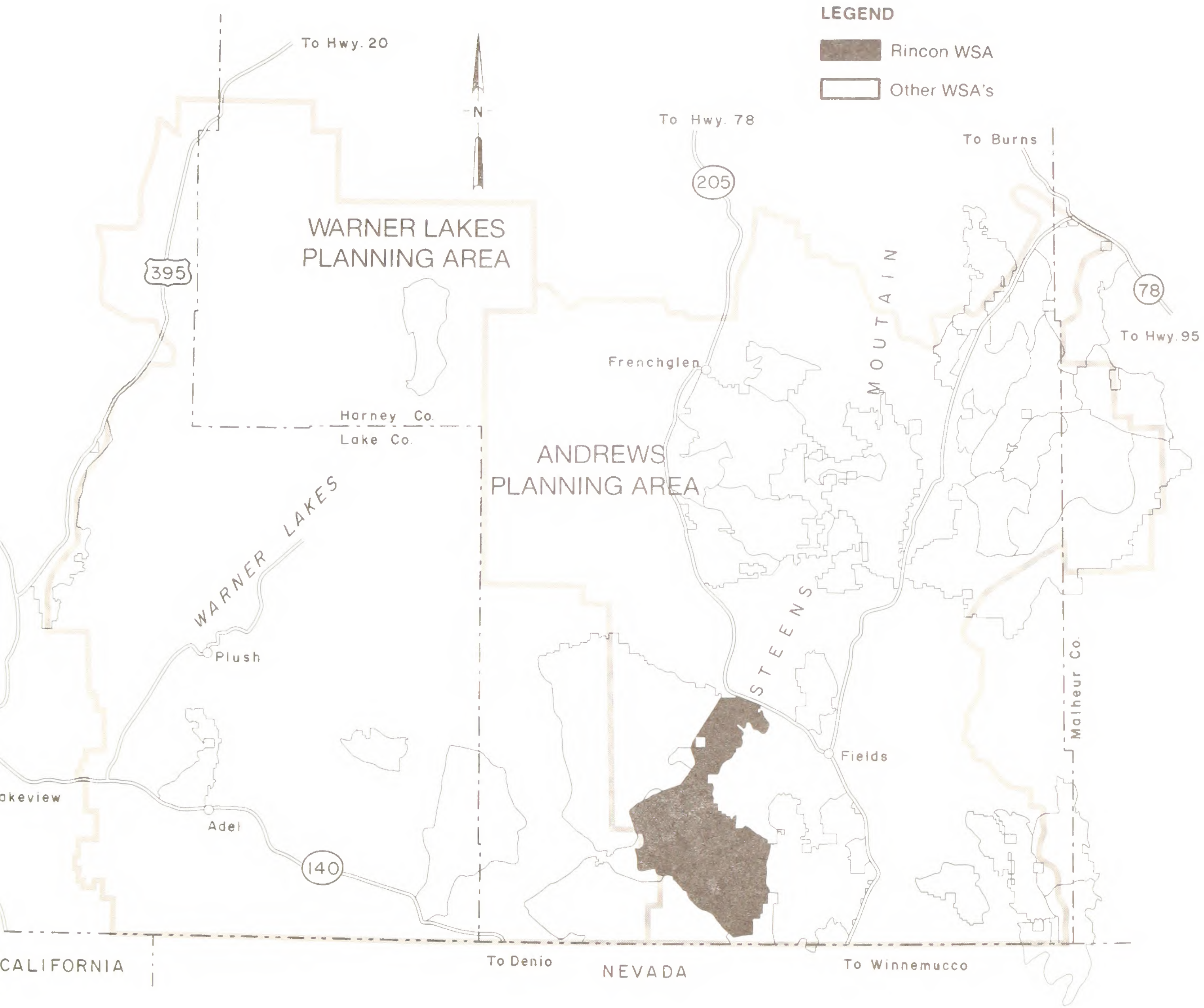
[3] Expected future increases from proposed livestock and wildlife projects.

[4] Vegetative manipulation projects involving up to $90,370 total expenditures, and a structural project involving up to $324,400. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[5] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[6] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 4.

[7] See footnote 1. If the grazing adjustment is found to be unnecessary, compensating improvements would not be developed. Investments and grazing adjustments would be zero. The effects of this case are shown in parentheses.



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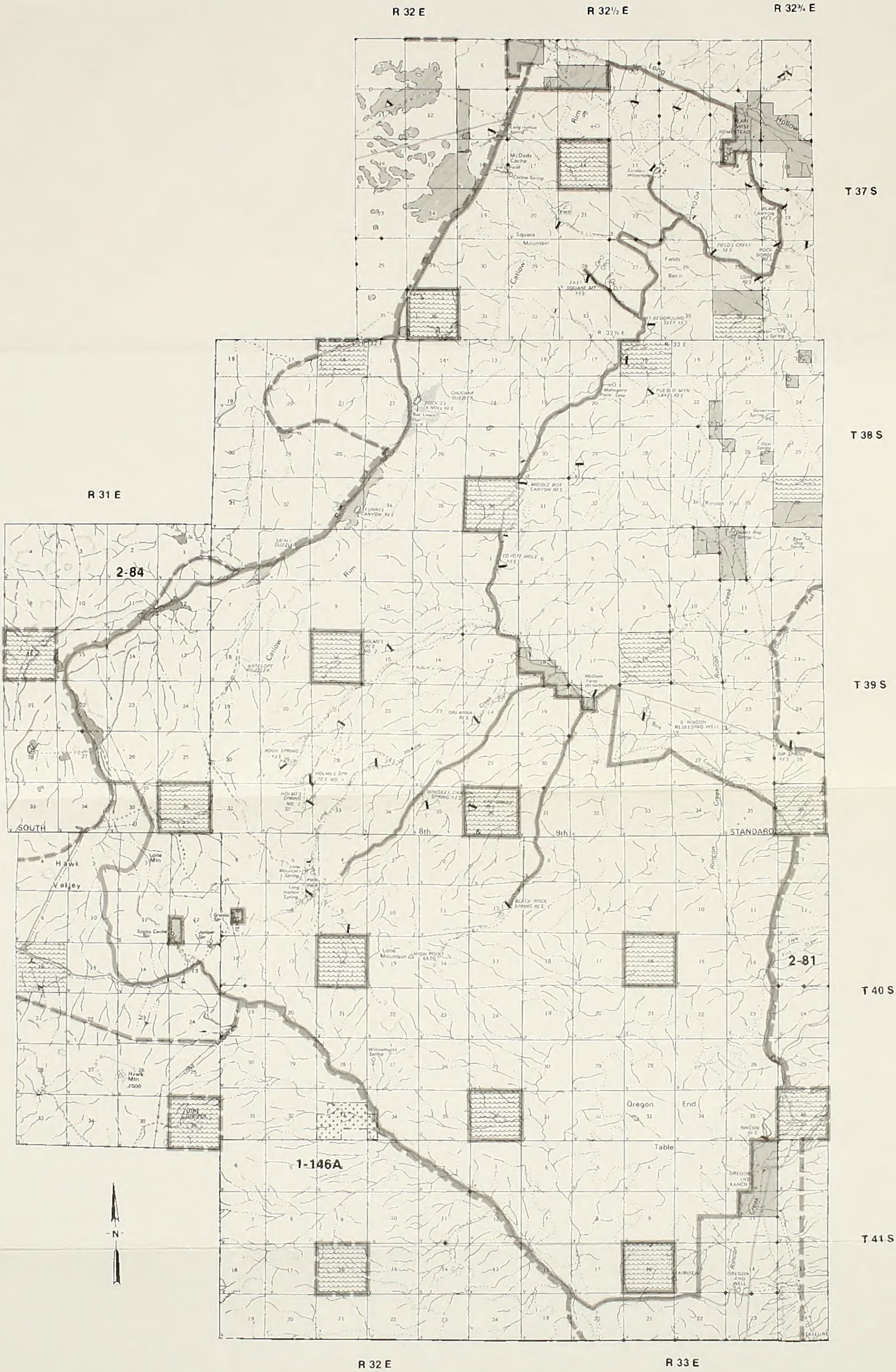
Burns/Lakeview Districts

Rincon WSA
OR-2-82

LOCATION MAP

MAP 1



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Burns/Lakeview Districts

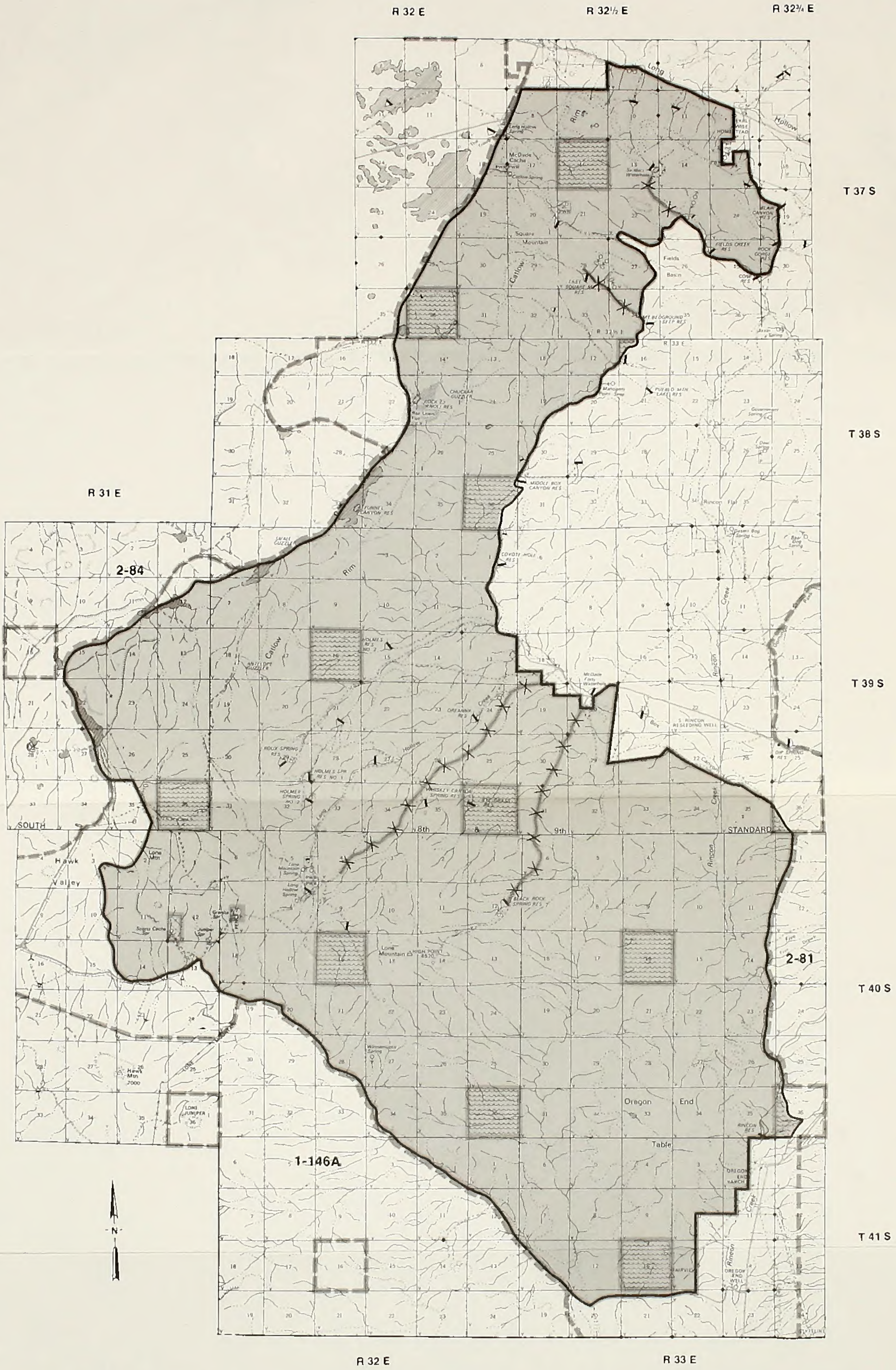
Rincon WSA
OR-2-82

LAND OWNERSHIP

LEGEND

- ▬ Wilderness Study Area Boundary
- ╍ Boundary of Adjacent Wilderness Study Areas
- ☐ Bureau of Land Management
- ▩ Private
- ▤ BLM Surface-State or Private Subsurface (Split Estate)
- ⁙ Long Draw Research Natural Area

MAP 2



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Rincon WSA
OR-2-82

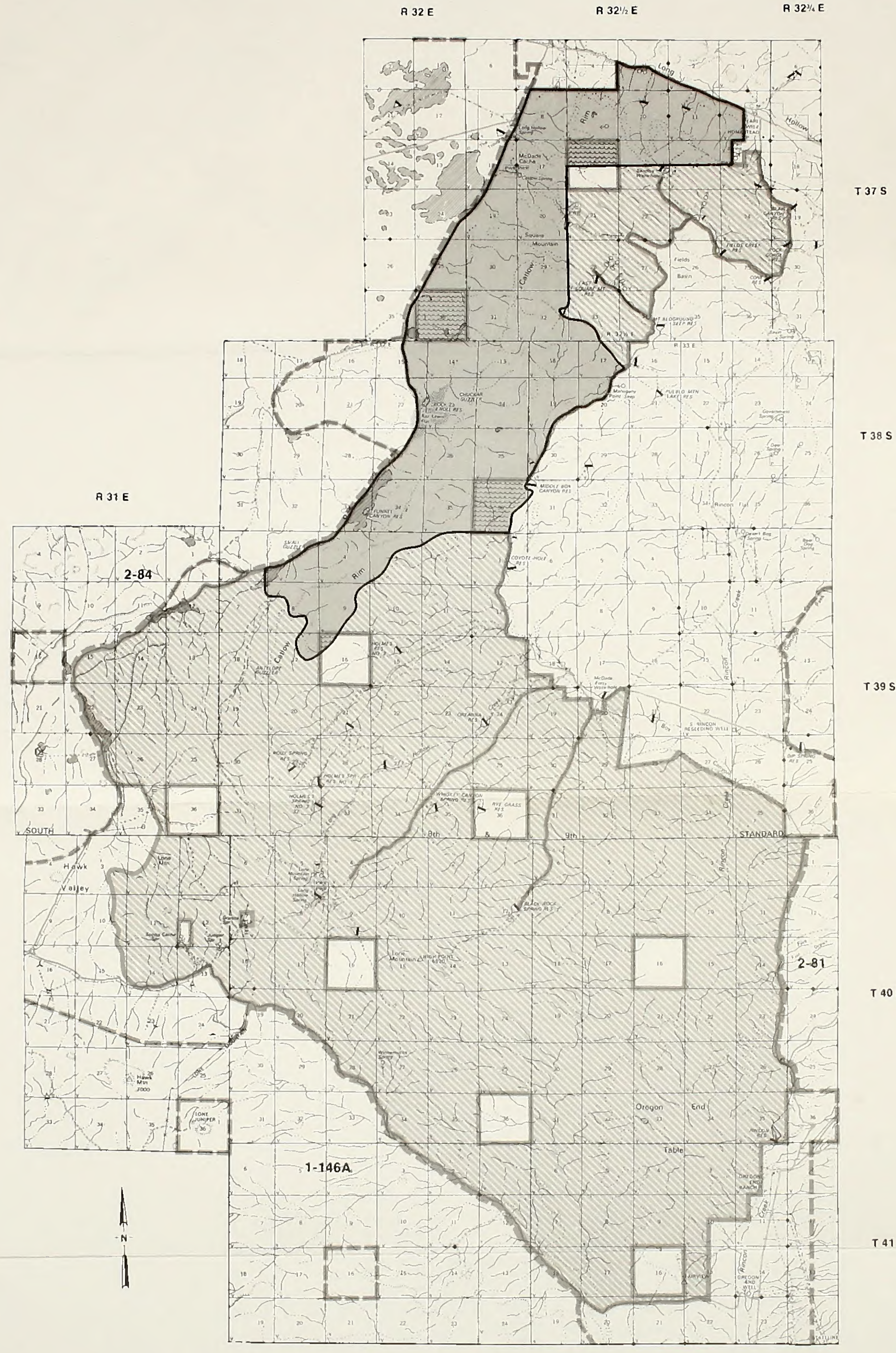
ENHANCED ALTERNATIVE

1 0 1 2 MILES

LEGEND

- Wilderness Study Area Boundary
- Boundary of Adjacent Wilderness Study Areas
- ▢ Recommended Suitable for Wilderness
- ▨ Non-Federal Land within Recommended Wilderness
- ▨ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness
- ✕ Recommended Road Closure

MAP 3



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Rincon WSA
OR-2-82

PARTIAL ALTERNATIVE

1 0 1 2 MILES

LEGEND

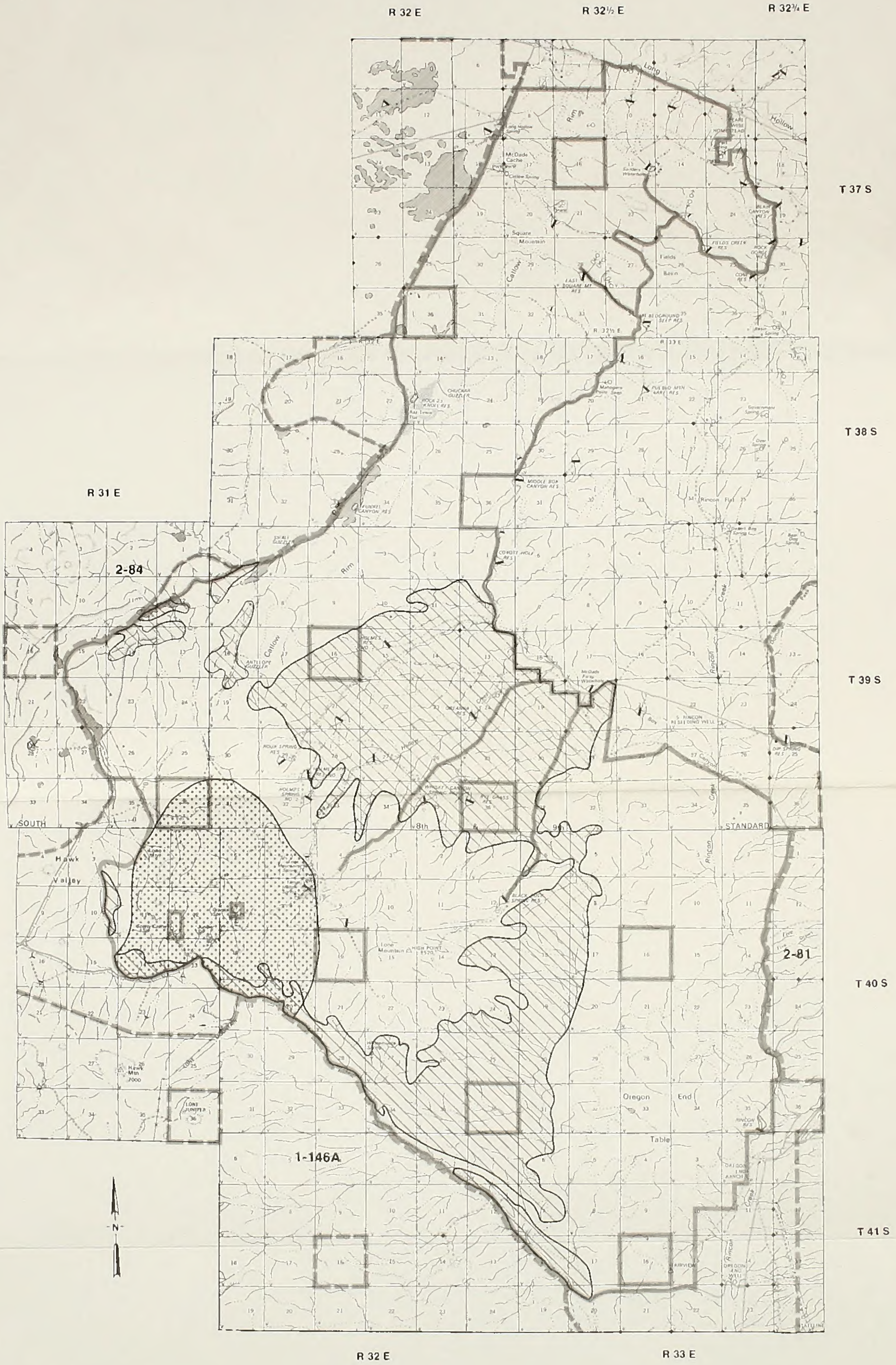
Wilderness Study Area Boundary

Boundary of Adjacent Wilderness Study Areas

▩ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness



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Rincon WSA
OR-2-82

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

▨ **Medium Potential (3A) for Diatomite**

░ **Medium Potential (3B) for Copper, Mercury and Gold**

Medium Potential (3A) for Copper, Mercury and Gold in Rest of Area

MAP 5

Rincon WSA, OR-2-82. The southern side of Lone Mountain looking north. Lone Mountain is not suitable under the partial (preferred) alternative but is suitable under the enhanced alternative. The photo shows rocky outcroppings in the Lone Mountain portion of the study area. A patch of juniper near Juniper Springs is visible on the left while Granite Springs, located on a 40-acre parcel of private land, is below a large rock outcropping to the right of center. The diversity of terrain enhances opportunities for solitude and recreation in this portion of the study area. August 1983.

Rincon WSA, OR-2-82. A view of Catlow Rim looking south on the northwest corner of the study area. The rim is recommended suitable under the enhanced and partial (preferred) alternatives. In this part of the study area the rim rises over 1,200 feet from the eastern perimeter of Catlow Valley to the right. Easily visible from this area are many of the individual basalt flows (visible as small ledges on the upper part of the rim) which form the plateau. August 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Alvord Peak Wilderness Study Area (OR-2-83)

General Description of Study Area

The Alvord Peak wilderness study area (WSA) is located about 82 miles south of Burns (about four miles north of Fields) in Harney County (see map 1). It lies adjacent to the Long Hollow county road and within a mile of the Folly Farm-Fields county road. The nearest highways are Oregon State Highways 205 and 78, 31 and 56 miles (respectively) to the north.

The study area contains 14,655 acres of public land and is roughly rectangular in shape (see map 2). Within the central portion of the study area lies a 640-acre parcel of which 80 acres are privately owned and 560 acres are split estate (federally managed surface, state or privately owned subsurface mineral rights).

The boundaries of the area are somewhat irregular and are formed by a variety of features. The eastern boundary is formed by two roads (one in combination with a powerline), the edge of a crested wheatgrass seeding and private land. The southern boundary is formed by a road and a powerline, while the northern boundary is a road and private land. All of the western boundary follows legal subdivisions created by split-estate land, private land, and BLM land which contains a concentration of man-made developments. Four dead-end roads (totaling four miles) also form part of the boundary, with one entering the WSA from the northwest, two from the east, and one from the southeast.

The dominant topographic feature in this study area is a ridgeline containing a series of ten peaks. The ridge runs from north to south through the center of the WSA and is the southern-most extension of the main ridge of Steens Mountain. The peaks along the ridge range in elevation from 6,189 feet to 7,132 feet, with the highest point in the WSA being Alvord Peak. From the ridgeline, the terrain slopes sharply to the east into the Alvord Basin, falling an average of 1,600 feet in about three-quarters of a mile. The lowest elevation (4,200 feet) occurs along the eastern side of the study area.

To the west of the peaks, the terrain slopes more gently toward a plateau area which is typical of the western side of the Steens. This part of the WSA contains rolling hills and some relatively flat land. There are no perennial streams in the study area, but numerous intermittent drainages run east and west from the summit of the ridge.

The study area contains a variety of grasses but the most common vegetation is big sagebrush. A small area of low sagebrush also occurs in the southwestern portion of the area. The WSA contains no juniper and only a small amount of riparian vegetation which is found around several springs.

Interrelationships

The entire study area has been designated as an Area of Critical Environmental Concern (ACEC). The ACEC was designated to protect this area as valuable habitat for bighorn sheep. The upper elevations have water, escape cover, and isolation which combine to provide excellent summer habitat for bighorns.

The management objectives for the ACEC will allow mineral development and continued use of the area by livestock while maintaining the integrity of the bighorn sheep habitat and minimizing the impacts to visual qualities caused by surface disturbing activities. Although a management plan had not been prepared for the ACEC as of January 1, 1985, management restrictions that are developed would continue to apply in the WSA whether or not the area is designated wilderness.

The Oregon Department of Fish and Wildlife maintains two wildlife guzzlers (small wildlife watering devices) within the WSA.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- possible development of the area's geothermal or mineral potential,
- wildlife values of the area, and
- outside sights which would influence a person's perception of naturalness and solitude in the WSA.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- no wilderness/no action (preferred alternative)

A partial alternative is not analyzed because there are no opportunities to eliminate conflicting resource values by reducing the size of the area recommended suitable and still maintain an area which has wilderness characteristics.

All Wilderness

The all wilderness alternative would recommend all 14,655 acres of the Alvord Peak WSA suitable for wilderness (see map 2). For purposes of analysis, it is assumed the 640 acres of split-estate and private inholdings would not be acquired. The dead-end roads which enter the study area would remain open.

Enhanced Wilderness

The enhanced wilderness alternative would recommend all 14,655 acres of public land in the WSA suitable for wilderness designation (see map 3). Also, an attempt would be made to acquire the 80 acres of private and 560 acres of split-estate inholdings. These lands could be acquired through purchase or exchange with willing landowners.

Assuming acquisition of these lands, total area recommended suitable under this alternative would be 15,295 acres.

The four dead-end roads which enter the area would be closed, except as necessary to maintain existing range improvements. There would be no changes in the study area boundary except for the dead-end road closures.

Both land acquisition and road closures would help to improve the manageability of the area as wilderness as well as maintain the area's natural character and opportunities for solitude. Manageability would be improved by eliminating the need for access to the inholdings. This would also benefit naturalness and solitude by precluding the possible future development of the inholdings, though no development is planned at this time. The road closures would primarily benefit opportunities for solitude by eliminating vehicle use.

No Wilderness/No Action (preferred alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- construction of proposed livestock grazing improvements, including water developments and fencing, and

- continued availability for mineral exploration and development, controlled to minimize the effects on bighorn sheep and the area's visual qualities.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The Alvord Peak WSA is manageable as wilderness under both the all wilderness and enhanced wilderness alternatives. Manageability problems could occur under the all wilderness alternative due primarily to the private and split-estate inholdings and the possibility for development and access to them. Although there are no developments planned for these inholdings, the parcel lies within an area of high potential for mineral occurrence and development is possible.

Table 1. Summary of Proposed Management Under Each Alternative, Alvord Peak WSA (OR-2-83)

Proposed Management	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	14,655	14,655	0
Acres Closed to ORVs by Wilderness Designation	14,655	14,655	0
Miles of Roads Closed	0	4	0
Miles of Ways Closed	3	3	0
Acres of Full Fee Estate Acquired[1]	0	80	0
Acres of Split Estate Acquired[1]	0	560	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	14,655	14,655	0
Structural Livestock Projects Developed:			
Reservoirs & Waterholes (numbers)	0-2	0-2	2
Springs (numbers)	0-2	0-2	2
Pipelines (miles)	0-2	0-2	2

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

The study area's common boundaries with private land should not be a significant manageability problem under either the enhanced wilderness or all wilderness alternatives. Although these boundaries follow legal subdivisions and are not easily identified, most of the private boundary parcels are not near those portions of the WSA expected to receive the greatest amount of recreation use. Improving the identification of the boundary in these locations through fencing or signing would eliminate most of the problems.

Manageability of the Alvord Peak WSA as wilderness could be difficult if development occurred on the adjacent private land. Because the private lands also have moderate to high potential for mineral development, and because most of the WSA overlooks the private lands, their development could have an adverse effect on the natural character of the WSA.

Two geothermal leases totaling 640 acres were issued before the passage of the Federal Land Policy and Management Act in 1976 and do not have wilderness protection stipulations. The leases could be developed either before or after the area was designated wilderness. Such disturbance would create problems with managing the area as wilderness.

Continued or increased use of the dead-end roads which enter the WSA could also cause manageability problems under the all wilderness alternative, but existing use is light and is not expected to increase substantially. Under the enhanced wilderness alternative, the manageability problems associated with the inholding and the dead-end roads would be eliminated. Potential problems with the development of adjacent private land could occur, but there are no known plans for development at this time.

None of the manageability problems is sufficient to preclude designation of the area as wilderness.

Rationale for the Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because the benefits from possible mineral

Table 2. Summary of Environmental Consequences of Alternatives, Alvord Peak WSA (OR-2-83)

Resource or Activity	All Wilderness	Enhanced Wilderness	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 14,655 acres to the NWPS and preserve wilderness characteristics and area's special features, including Alvord Peak and the bighorn sheep habitat, crucial deer winter range, areas of geologic interest, a plant species of special interest, and the scenic qualities of the southern end of the Steens. Closure of 3 miles of ways would enhance the naturalness of the area and improve opportunities for solitude and primitive recreation. Mineral development on inholdings could adversely affect wilderness values. Although minor manageability problems occur, the area is manageable as wilderness.	Would add 15,295 acres to NWPS, assuming acquisition of 640 acres of private and split-estate inholdings. Includes all of the features identified in the all wilderness alternative. Closure of ways would have same effect as all wilderness alternative, and closure of 2 1/2 miles of dead-end roads would further enhance wilderness values. Improves manageability by acquiringinholdings.	Wilderness values and special features would be subject to possible disturbance from the development of mineral or energy resources. The ACEC would provide some restrictive protection.
Energy and Mineral Development	Development precluded on 14,655 acres, including 14,655 acres with high potential for metals, and 366 acres with high geothermal potential.	Same as all wilderness, except development precluded on an additional 640 acres, if inholdings are acquired.	No impact.
Wildlife	One guzzler may be abandoned due to increased maintenance cost, reducing water availability and causing populations of small animals to decline.	Same as all wilderness.	No impact.
Livestock Grazing	If proposed livestock improvements not allowed, the opportunity to provide 915 AUMs in WSA to help alleviate apparent overgrazing would be precluded, possibly resulting in a decrease of licensed use of up to 915 AUMs.	Same as all wilderness.	All proposed range improvements permitted, making 915 AUMs available to help alleviate apparent overgrazing. This would not result in increased licensed use in the allotment.
Recreation Use	Use of motorized vehicles restricted to dead-end roads, but this would not affect amount of recreation use. No significant impact on overall recreation use.	Motor vehicles eliminated from study area. Impact on recreation use would be slight, and it is expected that there would be some increase in visitor use. No significant impact on overall recreation use.	Existing vehicle-oriented uses of the area would continue and could benefit from additional access from development. Primitive recreation would be adversely affected. No significant impact on overall recreation use.
Economic Value and Local Income	Decrease in economic value and local personal income by $13,597 and $9,665, respectively, if proposed projects and management increases are not allowed, and from loss of oil and gas leases. Decrease in economic value by $8,366 and decrease in local personal income by $2,006 if proposed projects and management increases are allowed. The maximum increase in transportation costs to ranchers with grazing permits would be $38.	Same as all wilderness.	Decrease in economic value by $1,668, and no change in local personal income from construction of proposed projects.

development outweigh the benefits to be gained from designation of the area as wilderness. Although the study area has several wilderness values, including habitat for bighorn sheep, it is also located within an area identified has having high potential for the occurrence of energy (geothermal) and mineral (mercury, copper, and gold) resources. (Both mercury and copper are strategic and critical minerals.)

Affected Environment

This section discusses only those activities or resources which influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Alvord Peak WSA is in a relatively natural condition. Most of the man-made features occur at or near a boundary, leaving the interior free of developments. The WSA contains 26 developments: 7 reservoirs, 3 developed springs, a 1/4-mile pipeline, 2 guzzlers, 6 short ways (vehicle routes established and maintained solely by the passage of vehicles) totaling 3 miles, 3 fences totaling 1 1/2 miles, 2 locations with buildings, and an area of past mining activity. These features are small and most of them are screened by topography. In addition, they are not concentrated in any one portion of the area. They influence only about 6 percent of the WSA. (The area of influence is an estimate of the acreage within the WSA from which each man-made feature can be seen.)

The vehicle ways are overgrown and lie in drainages where they are screened. Most of the reservoirs in the study area also lie within a drainage and are screened by topography. Two reservoirs and a guzzler are located in open areas and are more easily seen than the majority of the developments. There are two locations on the east side of the WSA which contain structures. Both occur within areas which are not easily seen from a distance, but which are quite visible from the immediate vicinity of the development. These structures are associated with past mining activity.

Outside sights and sounds do not affect the overall quality of naturalness for the average visitor. The developments which occur outside the area include two county roads, a crested wheatgrass seeding, a large reservoir, and powerlines. Although these developments are visible from various points within the study area, they are not substantial enough to detract from the natural appearance of the WSA or affect opportunities for solitude or primitive types of recreation.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Outstanding opportunities for solitude are available in the Alvord Peak WSA, primarily because of topographic screening provided by the ridgeline, the peaks, the rock outcroppings, and the numerous drainages and hills located in the western three-quarters of the area. The eastern quarter of the WSA has large, flat areas with some rolling hills. This section of the study area is less conducive to solitiude, as it provides fewer secluded spots. The study area contains no vegetative screening which would enhance the opportunities for solitude.

Opportunities for primitive and unconfined recreation are also outstanding within the WSA. Day hiking, chukar hunting, wildlife observation, sightseeing, and photography are the primary activities available in the Alvord Peak area. The area's rugged topography provides a challenge for the hiker. In addition, the presence of an elusive herd of bighorn sheep, the sharp contrast of brightly colored lichens on dark basalt rock, and the broad scenic vistas from the summit of the ridgeline not only add to the hiking experience, but provide opportunities for the photographer and sightseer.

Opportunities for backpacking and horseback riding are also available within the area but are somewhat limited due to the relatively small size of the WSA.

Hunting opportunities are excellent for chukars on the lower eastern slopes of the area. Although deer and antelope are present in the WSA, their numbers are limited and the hunting opportunities are fair.

Special Features

Special wilderness features of the study area include the geologic, wildlife, vegetative, and scenic features, which add to the value of the area as wilderness.

The Steens Mountain fault block is divided into three topographic units known as Northern Steens, High Steens, and Southern Steens. The Alvord Peak WSA is located at the southern end of the Southern Steens unit and is characterized by rugged, irregular terrain.

Features of geologic interest include Sharp Peak, near the northern end of the study area, and Alvord Peak, about 3 miles to the south. These peaks were formed by lava flows of a different nature than that of the surrounding formation. They are composed of rhyolitic and dacitic lavas, which are highly viscous and commonly form volcanic domes.

Along the eastern foothills of the Southern Steens, two other notable features can be seen. Basalt dikes have formed narrow ridges which generally run parallel to the range. Mineralized fracture zones also form ridges or "reefs" along the foothills. Both the dikes and the mineralized "reefs" are more resistant to erosion than the surrounding rocks and stand out as notable features.

Wildlife values are a special feature of this study area because the high peaks in the central portion of the WSA provide excellent summer range for a herd of bighorn sheep. This herd of sheep is 1 of only 5 herds on BLM lands in the Burns District.

Another wildlife feature of significance within the Alvord Peak study area is a small amount of crucial deer winter range. The winter range is located in the lower foothills along the northeastern side of the WSA.

A plant species of special interest, *Phacelia gymnoclada*, occurs in the area. (See the Vegetation section for more information.)

The scenery of the Alvord Peak area is a special wilderness feature because the eastern side has outstanding scenic quality. The scenic portion of the area includes all of the eastern face of the ridgeline.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the WSA is in the Intermountain Sagebrush Province and the potential natural vegetation is saltbush-greasewood and sagebrush-steppe communities.

Ecosystems identified in the Basin and Range section of the Oregon Natural Heritage Plan which occur in this WSA are big sagebrush/Idaho fescue, big sagebrush/bitterbrush/Idaho fescue, low sagebrush/Idaho fescue, and big sagebrush/bluebunch wheatgrass.

The study area is within 5 hours' driving time of one standard metropolitan statistical area with a population over 100,000: Boise, Idaho.

Energy and Mineral Development

The geology, energy and mineral resources of the Alvord Peak WSA were evaluated by interpreting existing literature, reviewing mining claim and mineral leasing records, correlating rock units in the WSA with similar environments in areas known to contain mineral resources, and by evaluating a geochemical sampling program conducted by BLM. Technical details of the evaluation are in a mineral resources assessment report, Pueblo Valley Geologic Resource Area (GRA OR-020-21), Harney County, Oregon, prepared by TERRADATA, a consulting firm under contract with BLM, and in a BLM report on the Fields Geologic Resource Areas.

The WSA is within the Pueblo Valley geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA is rated highly favorable for the occurrence of mercury, gold and copper. The geologic environment, inferred geologic processes, occurrences of mercury, copper, and gold, and mines and prospects provide direct evidence to support this rating. Mercury and copper are strategic and critical minerals; but there are no known deposits of strategic and critical minerals within the WSA.

A very small portion of the Alvord Peak study area falls within the Alvord Known Geothermal Resource Area (KGRA, a federally defined area with specific boundaries within which geothermal resources are known to exist). Following legal subdivisions on the extreme eastern side of the WSA, the KGRA boundary covers less than 300 acres of the study area. The area covered by the KGRA includes only the lower slopes near the eastern boundary.

Also, the southeast edge of the WSA is rated highly favorable for the occurrence of geothermal resources. It lies along the Alvord Valley and a small part lies within the Alvord KGRA. Major hot springs and faults, high geothermal gradients in test holes, and favorable geophysical information make the Alvord Valley a prime geothermal prospect.

All or parts of 30 mining claims lie within the WSA, 640-acres are under 2 geothermal leases, and 3 oil and gas leases cover 6,660 acres, as of January 1, 1984.

Table 3 shows the mineral potential classifications for the WSA. Map 4 shows the portion of the WSA rated high for geothermal resources, as well as the portion within the KGRA.

Surface rocks in the WSA are Tertiary volcanic rocks consisting mainly of massive basalt flows, minor interbedded tuffs and tuffaceous sedimentary rocks, and Quaternary sedimentary rocks including unconsolidated sand, silt and gravel deposits.

Vegetation

The major plant communities which occur in Alvord Peak WSA are big sagebrush/bunchgrass, low sagebrush/bunchgrass, and a big sagebrush-low sagebrush complex.

The big sagebrush/bunchgrass community occurs extensively on the low- to mid-elevation foothills in the eastern and southern portions of the WSA. Squirreltail, Sandberg's bluegrass, and cheatgrass are common on the flat to gently sloping areas, while bluebunch wheatgrass or Idaho fescue form the bulk of the grass cover on the steeper slopes. Bitterbrush occurs sporadically throughout this community on eroded south slopes. Purple sage, spiny hopsage, needlegrass, and ricegrass are the dominant species. The big sagebrush/bunchgrass community is estimated to be generally in mid-seral stage. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in the succession of vegetation types.) The climax vegetation is bluebunch wheatgrass and big sagebrush. Idaho fescue is the dominant grass on the steep north slopes.

Table 3. Classification of Energy and Mineral Potential, Alvord Peak WSA (OR-2-83)

Commodity	Area	Classification Level	Confidence Level
Metals (copper, mercury, and gold)	Entire WSA	4	D
Geothermal	See map 4	4	D
	Rest of WSA	2	B
Uranium/Thorium	Entire WSA	2	B
Coal	Entire WSA	1	C
Oil/Gas	Entire WSA	2	A
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	C
Bentonite	Entire WSA	2	A
Diatomite	Entire WSA	2	A
Zeolites	Entire WSA	2	A

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

On the higher slopes and the tops of ridges, the low sagebrush community dominates. The estimated successional stage is mid-seral. The probable climax species are Idaho fescue and low sagebrush with Sandberg's bluegrass replacing Idaho fescue on the more harsh sites.

The third community is a complex where big sagebrush and low sagebrush are intermittently the dominant species. This community occurs primarily in the western portion of the WSA. The estimated successional stage of this community complex is mid-seral. Climax species are big sagebrush, low sagebrush, Sandberg's bluegrass, and Idaho fescue. Bitterbrush occurs in small amounts.

One species of special interest has been identified in this area: *Phacelia gymnoclada* (thick-leaved phacelia), which is on List 2 of the Oregon Natural Heritage Plan's 'Rare, Threatened, and Endangered Plants and Animals of Oregon'. The plant occurs on the east slope of the major ridge within the study area.

Wildlife

The WSA provides habitat for species using the steep rimrock and talus found along the east side of Steens Mountain. Big sagebrush and low sagebrush are habitat types for many of the wildlife species in the WSA.

Much of the area is excellent chukar habitat with a good interspersion of water, forage, and talus and rimrock used for cover. Valley quail are found along drainages and uplands along the east side of the area. Sage grouse use the gentle western slopes.

Golden eagle, prairie falcon, American kestrel, great horned owl, and common raven use the area.

Mule deer and antelope make light use of the area yearlong. There is a small area of crucial deer winter range in the lower foothills along the northeastern side of the WSA. Up to 50 California bighorn sheep range over the steeper slopes during the summer, but winter out of the WSA.

Nongame wildlife species using the low sagebrush and big sagebrush habitat types include Brewer's sparrow, sage sparrow, western meadowlark, sage thrasher, black-tailed jackrabbit, and least chipmunk. Rimrocks and talus provide habitat for such species as yellow-bellied marmot, bushy-tailed wood rat, canyon mouse, long-eared myotis (bat), and small-footed myotis.

The study area contains two wildlife watering devices (guzzlers) which require maintenance twice each year.

Livestock Grazing

Portions of two grazing allotments are within the WSA. Table 4 summarizes existing and potential livestock use in AUMs (animal unit month, the amount of forage required by one cow and calf, or equivalent animals, for one month).

Existing livestock developments in the WSA (among the man-made features discussed in the Naturalness section) are 7 reservoirs, 3 spring developments, a 1/4 mile pipeline and 1 1/2 miles of fence.

Livestock improvements proposed within the study area to improve livestock distribution and range condition include 2 springs, 2 reservoirs and 2 miles of fence. All of the proposed improvements would be developed in the Andrews allotment and would provide a potential increase in forage of 915 AUMs within the WSA. However, licensed livestock use within the allotment would not change; 915 AUMs would be shifted from outside to inside the WSA.

Grazing operators seldom use motor vehicles within the study area, except to spread salt and check reservoirs. Otherwise, horses are used to manage livestock within the study area.

Recreation Use

Current recreation use in the Alvord Peak WSA is mostly oriented toward hunting. Primitive recreation that is not hunting-oriented is light.

Chukar hunting is the most common activity in the area. High use occurs within the WSA. Most of this hunting takes place on the lower foothills of the eastern side of the area. Deer and antelope hunting within the area is light.

Vehicle use for recreation is infrequent. Because access into the WSA is limited to a few roads and ways which penetrate the study area for only a short distance, vehicle-oriented recreation is restricted to the perimeter of the area.

Economic Value and Local Income

Livestock grazing, oil and gas and geothermal leasing and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were 3 oil and gas leases, and 2 geothermal leases on the WSA.

Economic value and local personal income generated from existing levels of resource outputs of these lands are presented in table 5. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact

Table 4. Existing and Potential Livestock Use, Alvord Peak WSA (OR-2-83)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot in WSA	Current Actual Use in WSA (AUMs)	Potential Decrease in Pasture (AUMs)
Andrews (No. 6019)	3,827	4/16-10/31	22	630	915
South Steens (No. 6002)	21,935	4/16-10/31	2	870	0
Totals	25,762			1,500	915

conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 14,655 acres to the National Wilderness Preservation System (NWPS). It would preserve the area's several wilderness qualities, including those associated with Alvord Peak and Sharp Peak, the Lava dikes, in the eastern foothills, and bighorn sheep habitat. The area is scenic and contains a plant species of special interest and crucial deer winter range.

Wilderness designation under this alternative would maintain or improve these qualities, as well as the current opportunities for solitude and primitive types of recreation, precluding major developments within the WSA. Closure of the 3 miles of ways would enhance the area's naturalness and improve opportunities for solitude and primitive recreation.

Development of minerals on the private and split-estate inholdings and access to the inholdings could aversely affect wilderness values on surrounding public lands. In addition, energy development on 640 acres of geothermal leases could occur because the leases contain no wilderness protection stipulations. BLM would have difficulty managing areas with such development to maintain a natural appearance. Opportunities for solitude and the quality of primitive recreation activities could also be adversely affected.

The **enhanced wilderness alternative** would add 15,295 acres to the NWPS, assuming acquisition of the 640 acres of private and split-estate inholdings.

Table 5. Economic Value and Local Personal Income Generated Annually, Existing Program, Alvord Peak WSA (OR-2-83) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	1,500	$11,310	$12,510
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil & Gas Leases	Acres	6,660	6,660	2,006
Geothermal Leases	Acres	640	1,280	385
Total			19,250	14,901

The effects of this alternative are nearly the same as the all wilderness alternative. However, acquisition of the inholdings would prevent possible mineral development on this parcel. This would improve the quality and manageability of the area as wilderness.

Closing the four dead-end roads would eliminate vehicle use and improve manageability of the WSA. It would also enhance opportunities for solitude and primitive recreation by preventing vehicle intrusions. Naturalness of the area would also be improved by allowing the four dead-end roads to revegetate and become less noticeable.

Naturalness, opportunities for solitude and the quality of primitive recreation could be adversely affected by any development or the geothermal leases, which do not have wilderness protection stipulations within the area recommended suitable.

Under the **no wilderness/no action alternative**, all of the wilderness values, including those associated with the special features, would be subject to disturbance from competing resource uses and activities.

Proposed livestock improvements could adversely affect the naturalness of the area, since proposed surface disturbing activities such as the 2 reservoirs would be allowed. Development of energy and mineral resources could further affect the natural character of the area.

Opportunities for solitude would be adversely affected as a result of additional vehicle access and use for new projects and possible mining activities. Primitive recreation values could be adversely affected by projects and mining activities, depending on the location and extent of disturbance to recreational opportunties.

The bighorn sheep and crucial deer winter range identified as special features would also be subject to disturbance from development of other resources.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development: 14,655 acres under the **all wilderness alternative**, and 14,655 acres plus an additional 640 acres if private and split-estate inholdings are acquired, as proposed under the **enhanced wilderness alternative**.

Included in the withdrawals under the all and enhanced wilderness alternatives would be 14,665 acres rated as highly favorable for the occurrence of metals (entire WSA), and 366 acres rated highly favorable for geothermal resources.

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness.

Under the **all wilderness and enhanced wilderness alternatives**, access to maintain the two guzzlers in the WSA would have to be on foot or horseback. This would not be a problem for maintaining the one guzzler near the county road, but it would be a problem for maintaining the other guzzler more than one mile from the nearest open road. If substantial repairs were required, this guzzler would probably be abandoned. This would reduce water availability for wildlife and populations of small animals would decline.

No impacts to wildlife are expected under the **no wilderness/no action alternative**.

Effects on Livestock Grazing

Under the **all and enhanced wilderness alternatives**, the proposed livestock developments in the WSA (2 springs, 2 reservoirs, and 2 miles of fence) might or might not be allowed, depending on a site-specific environmental assessment of whether they would conform with Wilderness Management Policy. If they were not allowed, the opportunity to make available additional forage within the WSA to help alleviate apparent overgrazing would be foregone. This could result in a possible decrease in licensed use within the allotment of up to 915 AUMs.

The proposed livestock improvements have a benefit/cost ratio greater than 1:1.

Inconclusive range survey data indicate that grazing could exceed the present carrying capacity in the Andrews allotment by approximately 1,865 AUMs (about 50 percent of the total licensed grazing use). If all of the proposed developments in the allotment were implemented, the additional forage gained in ten years would be nearly enough to offset the apparent excess livestock use. The preliminary estimate of the amount of apparent overgrazing is subject to refinement as the effects of future livestock grazing in the allotment are monitored.

Under the **no wilderness/no action alternative**, the proposed developments would be implemented, increasing the available forage within the WSA by 915 AUMs. Licensed use in the allotment would not change.

Closing the ways under the all wilderness alternative and closing the roads and ways under the enhanced wilderness alternative would not inconvenience the grazing operators, as motor vehicles are seldom used within the study area.

Effects of Recreation Use

The opportunities for participating in primitive recreation in the study area would be maintained under the **all wilderness alternative**. Because the dead-end roads would remain open, there would not be a reduction in vehicle-oriented recreation (primarily hunting).

Under the **enhanced wilderness alternative**, opportunities for primitive recreation would be maintained or improved. Closure of the dead-end roads would essentially eliminate vehicle use within the WSA, reducing the disturbing effects of vehicles. The road closure may result in a slight reduction of vehicle-oriented recreation use (hunting).

Existing primitive use of the area is limited; therefore, it is not expected that such use of the area would substantially increase under wilderness designation, although it may be enough to offset any reduction caused by vehicle restrictions.

Under the **no wilderness/no action alternative**, primitive recreation would be adversely affected by the development of range or other improvements. Vehicle-oriented recreation could benefit from additional access provided by the development of range improvements. Overall recreation use would not be significantly affected.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 6 and 7. Table 6 shows the

Table 6. Effects of Alternatives on Annual Economic Value, Alvord Peak WSA (OR-2-83) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +915	+915
Adjustment [2]	AUM	-915	-915
Oil and Gas Leases	Acres	-6,660	0
VALUE OF PLANNED INVESTMENTS [3]			
Grazing	$	0 to +6,899	+6,899
Investments [4]	$	0 to -1,668	-1,668
Net Economic Value	$	0 to +5,231	+5,231
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS			
Grazing:			
Adjustment	$	-6,899	-6,899
Reduced Access [5]	$	-38	0
Oil and Gas Leases	$-6,660	0	
Total	$	-13,597	-6,899
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS			
All categories [6]	$	-13,597 to -8,366 (-6,698)	-1,668 (0)

[1] Expected future increases due to range improvement investments.
[2] Adjustment for possible reduction in grazing is based on inconclusive data and may not be necessary.
[3] Structural projects involving up to $20,700 in total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[4] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.
[5] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.
[6] See footnote 2. If the grazing adjustment is found to be unnecessary, compensating improvements would not be developed. Investments and grazing adjustments would be zero. The effects of this case are shown in parentheses.

Table 7. Effects of Alternatives on Local Personal Income, Alvord Peak WSA (OR-2-83) (1981 price levels)

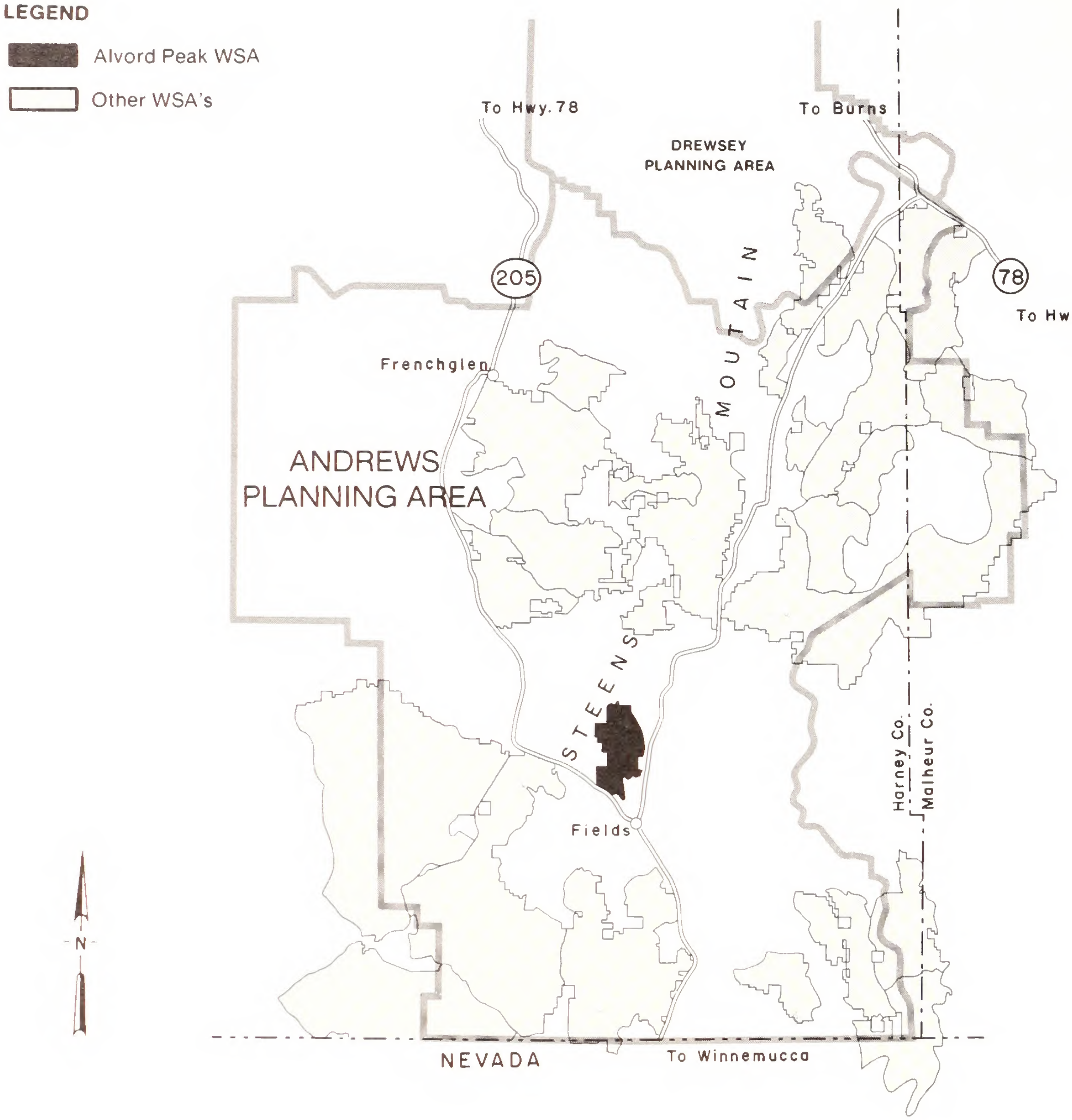
Item	Unit of Measure	All Wilderness, Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +915	+915
Adjustment [2]	AUM	-915	-915
Oil and Gas Leases	Acres	-6,660	0
INCOME FROM PROPOSED INVESTMENTS [3]			
Grazing	$	0 to +7,659	+7,659
Construction Activity[4]	$	0 to +2,781	+2,781
Total [5]	$	0 to +7,659	+7,659
INCOME FROM OTHER EXPECTED OUTPUT CHANGES			
Grazing:			
Adjustment	$	-7,659	-7,659
Oil and Gas Leases	$	-2,006	0
Total	$	-9,665	-7,659
INCOME FROM ALL OUTPUT CHANGES			
All categories [5] [6]	$	-9,665 to -2,006	0

[1] Expected future increases due to range improvement investments.
[2] Adjustment for possible reduction in grazing is based on inconclusive data and may not be necessary.
[3] Structural projects involving up to $20,700 in total expenditures, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[4] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.
[5] Total omits income from construction which is limited to 5-year period. See footnote 4.
[6] See footnote 2. If the grazing adjustment is found to be unnecessary, compensating improvements would not be developed. Investments and grazing adjustments would be zero. The effects of this case are shown in parentheses.

effects on economic value and table 7, the effects on local personal income. It is not known at this time whether individual proposed structural developments would be constructed if the area were designated wilderness.

The column for the all wilderness and enhanced wilderness alternatives show the effects as a range of values dependent upon whether structural improvements, and/or grazing operator access were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The all wilderness and enhanced wilderness alternatives would restrict such vehicle use unless there were no practical alternative to using vehicles. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $38 per year.



U. S. Department of the Interior
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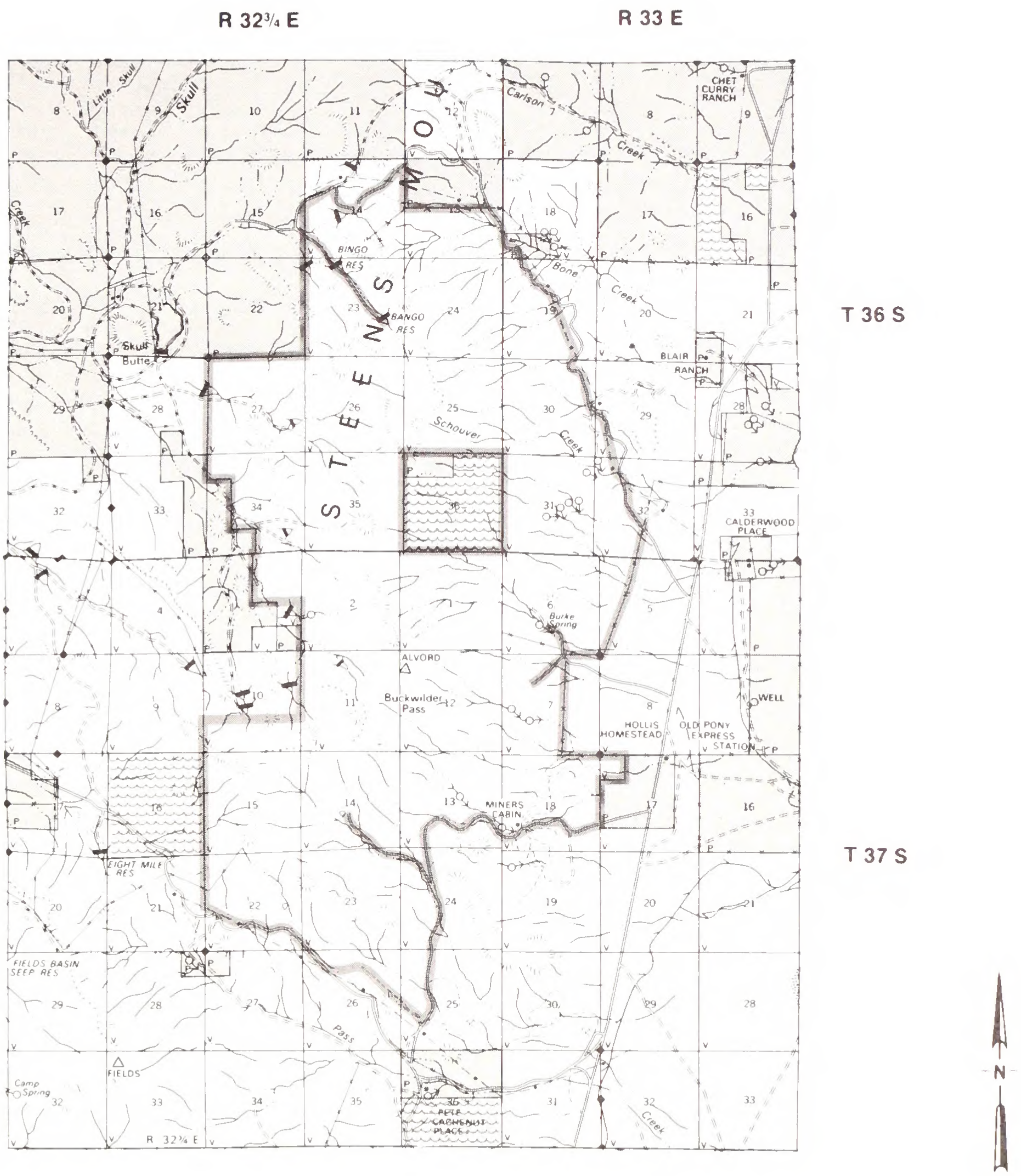
Burns District

Alvord Peak WSA
OR-2-83

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

☐ Bureau of Land Management

☐ Private

▨ BLM Surface-State or Private Subsurface (Split Estate)

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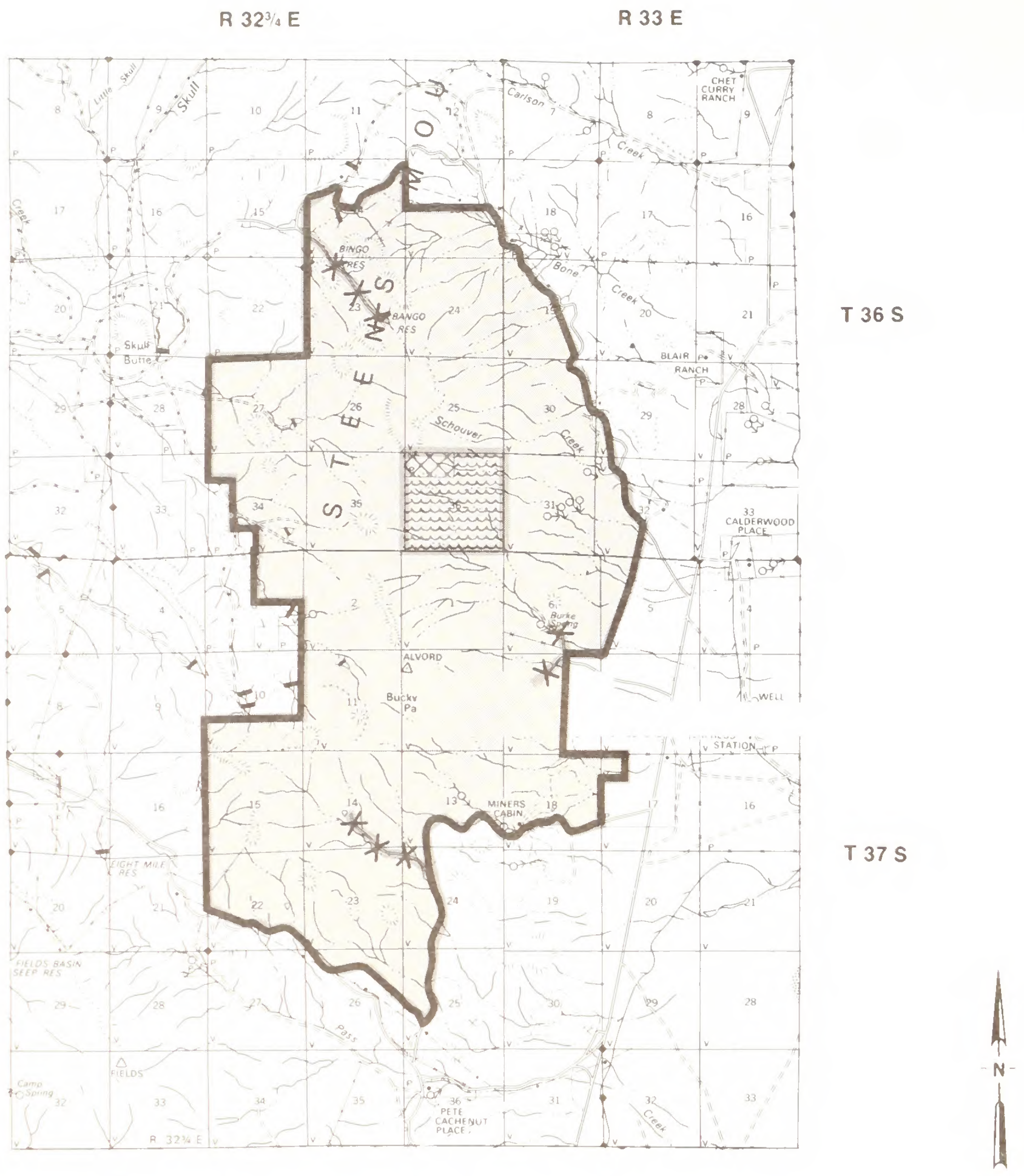
Alvord Peak WSA
OR-2-83

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

Wilderness Study Area Boundary

▭ Recommended Suitable for Wilderness

▩ Non-Federal Land within Recommended Wilderness

▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

✕ ✕ Recommended Road Closure

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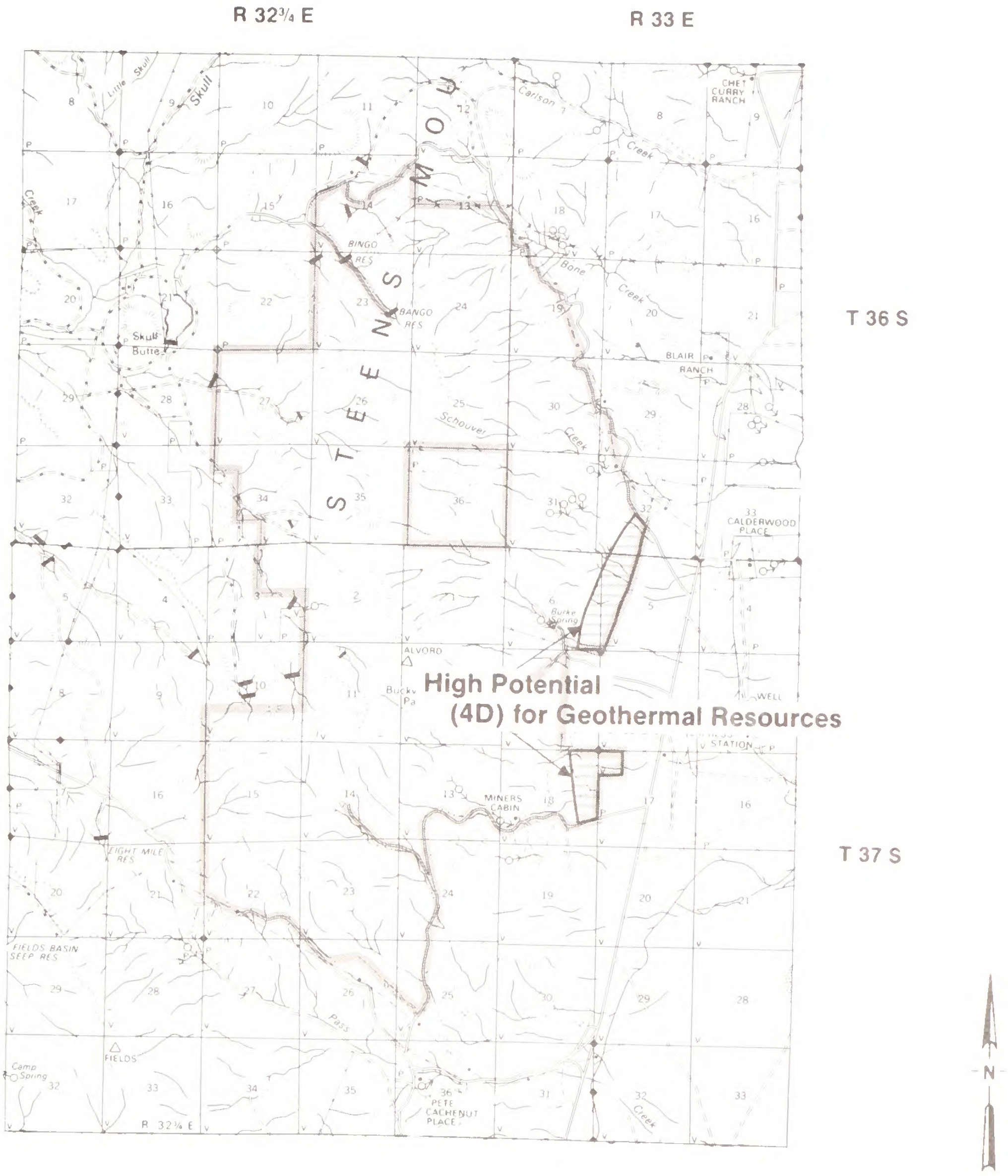
Alvord Peak WSA
OR-2-83

ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3



High Potential
(4D) for Geothermal Resources

Entire WSA:
High Potential
(4D) for Mercury, Copper and Gold

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Burns District

Alvord Peak WSA
OR-2-83

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

MAP 4

Alvord Peak WSA, OR-2-83. Near the top of a ridgeline looking south. With the exception of the background on the left (the Pueblo Mountains) all of this area is within the Alvord Peak WSA. Within the area recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. August 1983.

Alvord Peak WSA, OR-2-83. Taken from the county road paralleling the eastern side of the study area looking west showing the eastern face of the ridgeline from Alvord Peak (left) to the north. Within the area recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. Private land and part of a seeding which form the eastern boundary make up the flatter terrain in the foreground April 1984.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Basque Hills Wilderness Study Area (OR-2-84)

General Description of the Study Area

The Basque Hills wilderness study area (WSA) is located about 90 miles south of Burns (18 miles west of Fields and 10 miles north of the Oregon/Nevada state line) in Harney County (see map 1). The WSA is 24 miles south of the end of Oregon State Highway 205, and less than one mile from the county road which runs from Highway 205 to Fields.

The boundary of the Basque Hills WSA straddles about 19 miles of BLM's Burns and Lakeview District boundary. About half of the study area (the western side) lines within the Lakeview District.

The triangular-shaped area contains 137,220 acres of public land (see map 2). At the extremes, the study area is 22 miles long and 17 miles wide. Most of the eastern and western boundaries are formed by BLM roads and by widely scattered parcels of split-estate (federally managed surface, state or privately owned subsurface mineral rights) and private land located along the eastern boundary. A portion of the area's northern boundary is also formed by a BLM road, but the majority of this boundary lies adjacent to private property.

Three dead-end roads totaling 23 miles penetrate the WSA and also form part of the overall boundary. These roads enter the study area in the northwest corner, from the eastern boundary and from the southeastern boundary. Two split-estate sections (totaling 1,280 acres) and one 200-acre private parcel lie along one of the dead-end roads and are actually part of the study area's boundary. Within the boundary, the study area contains four 640-acre sections (2,560 acres) of split-estate land and one private parcel of 320 acres.

The Basque Hills WSA is a high desert area with some foothills and rimrock areas. The landscape is predominantly flat to very gently rolling, and most of the study area consists of broad flat expanses and a few low foothills. The major topographic features of the area include Fish Fin Rim in the northwestern corner, Red Butte and another rock outcropping also referred to as Fish Fin Rim near the center of the WSA, Coyote Rim and the Catlow Valley in the northeast, and the Basque Hills in the southeast. These features are separated by large expanses of relatively flat terrain.

Scattered throughout the area are dry lakebeds which are commonly found in shallow depressions. The largest of these lakebeds, Slickey Lake, is located in the northeastern portion of the study area in the Catlow Valley.

The average elevation of the WSA is about 5,000 feet. The lowest elevation, 4,520 feet, occurs near the northern boundary in the Catlow Valley while the highest point in the WSA, 5,909 feet, occurs in the Basque Hills along the southeastern boundary.

There are no perennial streams within the WSA. Many shallow intermittent drainages cross the study area, generally draining the area to the north and northeast into the Catlow Valley.

The vegetation throughout the WSA includes big sagebrush, rabbitbrush, scattered patches of low sagebrush, and a variety of grasses. In Catlow Valley, the northeastern portion of the area, a variety of species occurs including shadscale, greasewood, spiny hopsage, winterfat, Nuttal's saltbush, and basin wildrye.

Interrelationships

Adjoining the Basque Hills WSA across the east boundary road is the Rincon WSA (OR-2-82).

The Pueblo-Lone Mountain grazing allotment embraces part of the Basque Hills WSA, the adjacent Rincon WSA and two others, Hawk Mountain (OR-1-146) and Pueblo Mountains (OR-2-81) WSAs. Proposals to construct range improvements in the portion of the Basque Hills WSA within the Pueblo-Lone Mountain allotment are related to grazing management and improvements in the other three WSAs.

The Oregon Department of Fish and Wildlife conducts herd composition counts on antelope with low-level flights twice a year. They also maintain two wildlife guzzlers in the WSA, twice annually.

The U.S. Fish and Wildlife Service conducts a predator control program to control predator damage to livestock by aerially shooting coyotes.

The west part of the WSA is in the Beaty's Butte wild horse herd management area (HMA). HMA management will not be significantly affected by any of the alternatives.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- development of proposed livestock improvements,

- development of potential energy and mineral resources,

- possible designation of an east-west utility corridor through the north portion of the WSA, and

- management of wild horses in the WSA (see Statewide EIS volume).

Also raised as an issue was the possibility of combining the Basque Hills WSA with the Rincon WSA.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- no wilderness/no action (preferred alternative)

Closing the boundary road and combining the Basque Hills WSA with the adjacent Rincon WSA is not analyzed under the enhanced wilderness alternative. The road separating the two WSAs provides access for livestock users, private landowners, recreationists, and BLM personnel. These roads are significant access routes in areas where there is minimal access. In addition, combining the study areas would not significantly improve the manageability or wilderness qualities of either WSA.

A partial alternative is not analyzed because there are no opportunities to eliminate or reduce conflicting resource uses by recommending part of the WSA as suitable and still retain an area which has the necessary wilderness qualities.

All Wilderness

The all wilderness alternative would recommend all 137,220 acres of public land in the Basque Hills WSA suitable as wilderness (see map 2). For purposes of analysis under this alternative, it is assumed the split-estate and private parcels within the area would not be acquired and the dead-end roads which enter the area would remain open.

Enhanced Wilderness

The enhanced wilderness alternative would recommend the 137,220 acres of public land within the WSA suitable for wilderness (see map 3). In addition, an attempt would be made to acquire 4,660 acres of split-estate and private inholdings and boundary parcels. These parcels could be acquired through purchase or exchange with willing landowners and would include two parcels of private land (520 acres) and eight parcels of split-estate land (4,140 acres). Assuming acquisition of these parcels, total area recommended suitable under this alternative would be 141,880 acres.

The three dead-end roads (totaling 23 miles) within the area would be closed.

The land acquisitions and road closures would result in only minor boundary adjustments.

Under the enhanced wilderness alternative, the manageability of the Basque Hills WSA would be improved by eliminating the possibility of mineral resource development on the private and split-estate lands within the study area. This would also eliminate the need for access for these parcels.

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued use of vehicles for livestock management and recreation,

- implementation of proposed livestock improvement projects, including water projects, fencing, and vegetative manipulation (sagebrush control followed by seeding with crested wheatgrass),

- continued availability for mineral exploration and development, and

- possible powerline construction in a potential east-west utility corridor across the northern end of the WSA.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The Basque Hills wilderness study area would be manageable under the all wilderness alternative although there might be some manageability problems. These problems stem from the split-estate and private land within the study area boundary. If mineral resources were developed on these parcels and access were constructed across

Table 1. Summary of Proposed Management Under Each Alternative, Basque Hills WSA (OR-2-84)

Proposed Management	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	137,220	137,220	0
Acres Closed to ORVs by Wilderness Designation	137,220	137,220	0
Miles of Roads Closed	0	23	0
Miles of Ways Closed	71	71	0
Acres of Full Fee Estate Acquired [1]	0	520	0
Acres of Split Estate Acquired [1]	0	4,140	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	137,220	137,220	0
Vegetative Manipulation for Wildlife: Brush Control without Seeding (acres)	0	0	7,000
Structural Livestock Projects Developed:			
Reservoirs & Waterholes (numbers)	0-14	0-14	14
Wells (number)	0-3	0-3	3
Pipelines (miles) [2]	0-40	0-40	40
Fences (miles)	0-14	0-14	14
Stroage Tanks (number)	0-2	0-2	2
Vegetative Manipulation for Livestock: Brush Control with seeding (acres)	0	0	22,530
Restrictions on Potential Utility Corridors (miles added)	4.4	4.4	0

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

[2] Includes installation of five "bottomless" troughs.

Table 2. Summary of Environmental Consequences of Alternatives, Basque Hills WSA (OR-2-84)

Resource or Activity	All Wilderness	Enhanced Wilderness	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 137,220 acres to the NWPS, and preserve wilderness characteristics and special features, including wildlife (raptors) associated with Coyote Rim and the other rims and other rims and a plant species of special interest. Closure of 71 miles of ways would enhance naturalness and improve opportunities for solitude and primitive recreation. Development of minerals on inholdings and construction of access to inholdings could impair wilderness values. Although manageability problems could occur due to inholdings and dead-end roads, the area is manageable as wilderness.	Would add 141,880 acres to the NWPS, assuming acquisition of 4,660 acres of private and split-estate land. Preserves all features identified in the all wilderness alternative. Closure of 71 miles of ways would enhance wilderness values as in the all wilderness alternative and the closure of 23 miles of dead-end roads would further enhance wilderness values. Improves manageability by acquiring inholdings and closing roads.	Wilderness values and special features would be subject to possible disturbance by proposed range improvements, the development of mineral resources, or a potential utility corridor and power transmission line(s).
Energy and Mineral Development	Development precluded on 137,220 acres, including 137,220 acres with moderate potential for metals, and 62,815 acres with moderate potential for diatomite.	Same as all wilderness except development precluded on an additional 4,660 acres of private and split-estate land, if acquired.	No impact.
Vegetation	Vegetation preserved. Proposed water developments, if allowed, would alter vegetation succession and keep the seral stage at mid-seral.	Same as all wilderness.	Vegetative diversity reduced in brush control and seed. Proposed water developments would alter vegetation and keep the seral stage at mid-seral. Federal candidate species of special interest would be protected.
Wildlife	One wildlife guzzler may be abandoned due to increased maintenance expense, leading to slight decline in animal populations. Proposed brush control to improve antelope habitat foregone. Proposed livestock projects which could slightly increase wildlife populations might be precluded. Wildlife habitat preserved.	Same as all wilderness.	Wildlife and livestock improvements would benefit some species by increasing the availability of water and improving habitat. 7,000-acre burn would improve antelope habitat and increase numbers as would brush controls and seeding for livestock use. No significant impacts to other wildlife populations, although populations may increase slightly.
Livestock Grazing	Proposed vegetative manipulation projects would be precluded and 6,330 AUMs would be foregone. Structural developments might be precluded, and an additional 925 AUMs foregone in the South Steens and Beatys Butte allotments. Up to 1,360 in the Pueblo-Lone Mountain allotment which could be used to forestall possible decrease in licensed use would be foregone. Closing interior ways would cause inconvenience to grazing operator.	Same as all wilderness, except closing of roads would create additional inconvenience for grazing operators.	All proposed range improvements would be permitted. 6,330 AUMs would be made available by vegetative manipulation projects. 925 AUMs made available by structural developments in the South Steens and Beatys Butte allotments. Up to 1,360 AUMs in the Pueblo-Lone Mountain allotment realized, which could be used to forestall possible decrease in licensed use.
Utility Corridor Routing	Powerline construction within proposed utility corridor would not be allowed. Corridor would have to be rerouted around WSA additional 4.4 miles.	Same as all wilderness.	Would allow designation of utility corridor and construction within it. No impact.
Recreation Use	Use of motor vehicles for recreation would be restricted to roads. Some net reduction in overall recreation use as a result of prohibiting vehicles on ways. Oppotunities to increase wildlife populations from wildlife and livestock projects resulting in a slight increase in	Vehicle-oriented recreation would be eliminated as a result of closure of ways and dead-end roads. There would be a net reduction in overall recreation use as primitive recreation would not increase sufficiently to offset decline in vehicle-oriented recreation. Opportunities to increase	Vehicle-oriented uses of the area would increase. Primitive recreation uses would be inhibited by vehicle use. Increases in recreation use in and outside the WSA as a result of increased wildlife projects brought about by livestock and wildlife projects. Net increase in overall

Table 2. (continued)

Resource or Activity	All Wilderness	Enhanced Wilderness	No Wilderness/No Action (Preferred Alternative)
	recreation use in the WSA and outside the WSA could be foregone.	wildlife populations from wildlife and livestock projects resulting in a slight increase in recreation use in the WSA and outside the WSA could be foregone.	recreation use.
Economic Value and Local Income	Decrease in economic value and local personal income by $10,498 and $11,383, respectively if proposed projects are not allowed. Decrease in economic value by $10,098 and increase in local personal income by $7,742 if proposed projects are allowed. The maximum increase in transportation costs to ranchers with grazing permits would be $244.	Same as all wilderness.	Decrease in economic value by $12,258 and increase in local personal income by $63,344.

public lands, it would be difficult to manage the WSA to protect its wilderness values. There are no known development plans for these parcels at this time.

Another problem which could affect the management of the area as wilderness is the presence of a large amount of adjacent private land along the northern boundary. Most of this land is not marked or otherwise recognizable on the ground because the boundaries follow legal subdivisions. Problems with controlling recreational use in this area could occur. This probably would not be a substantial problem; recreational use within the WSA would be limited and would occur away from this boundary.

Rationale for the Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because the benefits of retaining options for intensive range development, extraction of potential mineral resources, and construction of a powerline across the area outweigh the benefits of preserving wilderness values.

The area is relatively free of man-made developments leaving it in a natural condition, and it offers outstanding opportunities for solitude. However, it offers limited opportunities for primitive types of recreation and has few special wilderness features. The opportunity for solitude within this area of over 100,000 acres is the dominant attribute of the WSA.

There are opportunities in the Basque Hills area to improve the capacity of the rangeland for livestock use through better distribution of water, subdividing the area for management purposes, and vegetative manipulation such as seedings. Under wilderness designation, some of these opportunities would be foregone.

Wilderness designation would prevent the development of the potential mineral resources of the area. The study area has been identified as having a moderate potential for the occurrence of mercury, copper, gold and diatomite.

If the area were designated as wilderness, the opportunity to construct a major east-west power/transmission line across the northern end of the area would be foregone. Wilderness designation of the WSA would require that any powerline in the proposed east-west corridor be routed around the area, thus increasing costs.

Affected Environment

This section discusses only those activities or resources which influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Basque Hills WSA is in a relatively natural condition. None of the man-made features within the study area is substantially noticeable and most of the features can be seen from only a very small portion of the study area.

The study area contains 42 man-made features: 20 are water developments including 16 reservoirs, 2 developed wells, and 2 wildlife guzzlers; there are also 19 vehicle ways (a vehicle route established and maintained solely by the passage of motor vehicles) totaling about 71 miles, 2 fences (totaling about 30 miles), the remains of an old horse trap, and a cow camp.

It is estimated that approximately 3 percent of the study area is influenced by these features. (The area of influence is an estimate of the acreage in the WSA from which these man-made features can be seen.)

Due to the relatively flat terrain of the majority of this area, most of the water developments can be viewed from only a small area in the vicinity of each development. Several of the reservoirs influence a larger area because of their locations near a high point or within a broad sloping depression. Overall, water developments influence less than 1 percent of the study area.

The 71 miles of vehicle ways in the study area consist of mostly overgrown vehicle tracks through the sagebrush. Generally, these tracks are not noticeable, except along their alignment. Only in a few instances are these ways clearly visible, or visible from adjacent higher elevations. One vehicle way is a well-defined extension of the road which crosses the eastern half of the study area and is visible within the immediate vicinity. However, even this way is sufficiently screened by vegetation from the surrounding terrain to make it substantially unnoticeable.

The most noticeable man-made feature is the district boundary fence which enters the study area from the north. During construction of the fence, a wide trail was bladed to remove sagebrush and make fence construction easier. A way, 7.5 miles in length, has also been established in this bladed trail. The way and fence are intermittently visible from the hills which rise to the west and south and from other portions of the surrounding terrain.

Most of the remaining fences easily blend in with the surrounding landscape. The fences only become a noticeable development within their immediate vicinity.

The remaining developments, the horse trap and the cow camp, have a very slight visual influence on the study area. Very little remains of the horse trap. Three stone fences provide the only indication of past activity. the cow camp is located adjacent to the boundary road on the southeastern side of the WSA. A ridgeline to the west of the camp screens this development from the remainder of the study area so very little area is influenced by this development.

The most significant outside sights are the roads which form the boundary of most of the area. They are generally visible from the WSAs perimeter. These roads present a noticeable visual contrast, but not substantial enough to detract from the natural appearance of the WSA. The other outside sight which has a very minor influence on the area is the Hawk Valley crested wheatgrass seeding, adjacent to the southeastern boundary. It does not detract from the wilderness character of the study area.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude in the Basque Hills WSA are outstanding. These opportunities are enhanced by the area's large size and the topographic screening provided by rolling hills. The low broad hills and rims in the central, eastern and northwestern portions of the WSA provide outstanding opportunities for solitude. There is no vegetative screening in this study area. Sagebrush is present throughout the area, but it is low growing and does not provide vegetative screening.

The area does not provide any outstanding opportunities for primitive forms of recreation. Opportunities for day hiking, backpacking, hunting, and sightseeing are only of moderate or low quality due to the lack of topographic and vegetative diversity.

Special Features

Three special features within the Basque Hills WSA add to the value of this area as wilderness.

A newly discovered plant species, *Eriogonum crosbyae*, which is of special interest, has been located in the northwest portion of the WSA. (The Vegetation section further discusses this plant species.)

Raptors concentrate in areas along Coyote Rim and the other rims in the eastern half of the WSA. Raptors actively nesting along the rims include golden eagles, red-tailed hawks, kestrels, and great-horned owls.

The kit fox, on the Oregon Department of Fish and Wildlife's List of Threatened Species, may range into the WSA.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the entire WSA is in the Intermountain Sagebrush Province and its potential natural vegetation is sagebrush steppe.

The WSA contains five vegetative ecosystems listed in the Basin and Range section of the Oregon Natural Heritage Plan. These are big sagebrush/bluebunch wheatgrass, big sagebrush/greasewood, Indian ricegrass/needlegrass community, winterfat community, and bare playa and playa margin communities.

The Basque Hills WSA is within 5 hours' driving time of the standard metropolitan statistical areas of Medford, Oregon; Boise, Idaho; and Reno, Nevada.

Energy and Mineral Development

The geology, energy, and mineral resources of the Basque Hills WSA were evaluated by interpreting existing literature, reviewing mining claims and mineral leasing records, and correlating rock units in the WSA with similar environments in other areas that are known to contain mineral deposits. Technical details of the findings of the evaluations are in a report of the assessment of mineral resources, Lone Mountain Geologic Resource Area (GRA OR-021-22), Harney County, Oregon, prepared by TERRADATA, a BLM contractor, and in a BLM report on the assessment of mineral resources in the South Harney GRA.

The WSA is within the geologic resource area, which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire WSA has a moderate favorability for the occurrence of metals. The geological environment is similar to environments found in the Pueblo-Steens Mountains where hydrothermal deposits of copper, mercury, and accessory gold occur in silicified fault zones. copper and mercury are strategic and critical minerals which are among the metals rated moderate in the WSA; but there are no such mineral deposits known to exist in the WSA. The area also has moderate favorability for the occurrence of diatomite.

Table 3 shows the mineral potential classifications in the WSA. Map 4 shows the portion of the WSA rated moderate (medium) for diatomite.

Aside from abundant road aggregate sources, there are no known occurrences of mineral deposits within the WSA. There were no oil and gas or geothermal leases and no mining claims within the WSA as of January 1, 1984.

The surface rocks are composed mainly of Tertiary volcanic units which fall into two general groups based on age. The oldest groups are composed of Miocene Steens Basalt flows with rate interlayers of

Table 3. Classification of Energy and Mineral Potential, Basque Hills WSA (OR-2-84)

Commodity	Area	Classification Level	Confidence Level
Metals (mercury, copper, gold)	Entire WSA	3	A
Geothermal	Part of WSA	2	B
	Part of WSA	1	B
Uranium/Thorium	Entire WSA	1	A
Coal	Entire WSA	2	C
Oil/Gas	Entire WSA	2	B
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	A
Bentonite	Entire WSA	2	A
Diatomite	See map 4	3	A
	Rest of WSA	2	A
Zeolites	Entire WSA	1	A

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

tuff, locally occurring andesite and basalt flows, and minor interbeds of tuffaeous sedimentary rocks and tuffs. Also included in this group are the tuffaceous sedimentary rocks and tuffs of the Trout Creek information. The second group of volcanic rocks (Pliocene age) are composed of semi-consolidated lacustrine (lake) tuffaceous sandstone, silstone, ashy diatomite, and interbedded flows of basalt and andesite.

Quaternary deposits consist of exogenous domes and flows of rhyodacitic composition, a few dikes and sills of basaltic composition, and alluvial deposits of gravel, silt, and sand.

Vegetation

The most common plant community in Basque Hills WSA is big sagebrush/ bunchgrass. On flat to gently sloping terrain, the most common understory species are squirreltail, Sandberg's bluegrass, and cheatgrass. Bluebunch wheatgrass and Thurber's needlegrass occur in areas of better conditions and on steep slopes. The successional stage is estimated to be mid-seral with the steeper areas being late seral. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) The primary climax vegetation is probably bluebunch wheatgrass and big sagebrush.

In the Catlow Valley portion of the WSA, other small vegetative communities exist on the flat valley bottom. Winterfat, greasewood, shadscale and Nuttal's saltbush are dominant shrubs on some sites, but much of the valley floor is grassland interspersed with various shrub species. Most of the grassland is composed of squirreltail, creeping wildrye, or Indian ricegrass.

Cheatgrass, Great Basin wildrye, and big sagebrush also occur in some areas. The successional stage of the valley floor is probably early to mid-seral. The climax vegetation will vary, but on most sites will generally be one of three communities: Nuttal's saltbush-winterfat/Indian ricegrass, big sagebrush/wildrye, or greasewood-shadscale/Indian ricegrass.

A plant species of special interest in this WSA (mentioned in the Special Features section) is: *Eriogonum crosbyae* (Crosby's buckwheat), a newly discovered species. This plant is a candidate species for federal listing as threatened or endangered.

Wildlife

There is poor distribution of water in the WSA, which has a major influence on wildlife during the warmer months by limiting deer and antelope use. Antelope winter in the south end of Catlow Valley.

Coyote Rim in the northern part of the WSA is heavily used by nesting raptors with three usually active golden eagle nests and seven inactive nests in the WSA. One prairie falcon nest has been located on Coyote rim. Other rims having heavy raptors use are in the southeastern corner, where there is usually one active prairie falcon next and two active golden eagle nests. Six other inactive golden eagle nests have been located in this portion of the WSA. Other raptors nesting in the area include great horned owl, red-tailed hawk, American kestrel, and common raven.

Chukars are found along Coyote Rim and other rimrock areas of the WSA. Most of the WSA is not good chukar habitat.

Common nongame wildlife include coyote, black-tailed jackrabbit, least chipmunk, antelope round squirrel, sage sparrow, Brewer's sparrow, horned lark, sage thrasher, western rattlesnake, and gopher snake. Bush-tailed wood rat, canyon mouse, and long-eared myotis (bat) may be found using cliff habitat found near Coyote Rim and other rough topography.

There is habitat for kit fox, which is on the Oregon Department of Fish and Wildlife's List of Threatened Species, and this animal may range into the WSA.

Two guzzlers (wildlife watering devices) have been installed in the WSA.

There is a proposed wildlife improvement project of brush removal on approximately 7,000 acres in the northern part of the study area. The project would create better habitat for antelope, and would occur in the same area as two proposed livestock projects involving sagebrush removal, seeding to crested wheatgrass, and water development. These proposed livestock improvement projects would also create antelope habitat by providing herbaceous vegetation which antelope prefer.

Livestock Grazing

The study area covers portions of three grazing allotments, two in BLM's Burns District and one in the Lakeview District. South Steens and Pueblo-Lone Mountain allotments are in the Burns District, while the Beatys Butte allotment is in Lakeview District. Table 4 summarizes the existing and potential livestock use in AUMs (animal unit month, the amount of forage required by one cow and calf, or equivalent animals, for one month).

Existing livestock improvements (among the man-made features discussed in the Naturalness section) include 16 reservoirs, 2 developed wells, and 2 fences.

Range improvements are proposed throughout most of the study area in all three of the allotments. The improvements would increase forage production through brush control and seedings, and improve livestock distribution and management.

The improvements proposed within the Pueblo-Lone Mountain allotment are 21 miles of pipeline and 9 waterholes. In the South Steens allotment, proposed improvements include 3 wells, 16 miles of pipeline, 2 waterholes, 4 miles of steel fence, 4 miles of electric fence, 2 storage tanks, 5 bottomless troughs, and 14,060 acres of sagebrush control and seeding to crested wheatgrass. In the Beatys Butte allotment, proposed improvements include 3 miles of pipeline, 2 reservoirs, 1 waterhole, 6 miles of fence and 7 vegetative manipulation projects (totaling 8,470 acres) involving burning to remove sagebrush and seeding to crested wheatgrass.

The Pueblo-Lone Mountain allotment projects are part of a total allotment plan which involves 3 other WSAs including the adjacent Rincon WSA. The 4,000 AUMs produced by projects throughout the allotment (including 1,360 AUMs from projects in the Basque Hills WSA) would not result in increased licensed use, but they would be used to offset possible reductions of up to 4,000 AUMs allotment-wide (3,800 of which is in the 4 WSAs).

In the South Steens and Beatys Butte allotments 4,850 and 2,405 AUMs, respectively, would be produced through proposed improvements in the WSA. These projects would increase available forage through seedings, improved livestock distribution from increased water sources, and better management. Licensed livestock use could increase by up to 7,255 AUMs in the 2 allotments.

Grazing operators frequently drive on the roads and ways to distribute salt and supervise livestock. Horses are used to move and gather livestock.

Utility Corridor Routing

Both the Pacific Power & Light Company (PP&L) and the Bonneville Power Administration (BPA) have under long-term consideration construction of a 500-kV power transmission line through an east-west utility corridor which would cross the northern end of the study area.

Recreation Use

Recreational use in the Basque Hills WSA is primarily oriented toward hunting. It is estimated that deer and antelope hunting both account for low visitor use.

Chukar hunting does occur in some portions of the WSA, but it is not known how much use occurs. The area does not provide good chukar hunting.

All hunting which occurs in this area is presumed to be vehicle-oriented. The study area currently receives little or no primitive recreational use.

Table 4. Existing and Potential Livestock Use, Basque Hills WSA (OR-2-84)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs)	Potential Decrease in WSA (AUMs)
South Steens (No. 6002)	21,935	04/16-02/28	18	1,125	4,850	0
Pueblo-Lone Mtn. (No. 6020)	19,329	12/01-02/28	9	1,100	0	1,360
Beatys Butte (No. 0600)	27,892	04/01-06/30	14	3,750	2,405	0
Totals	69,156			5,975	7,255	1,360

Economic Value and Local Income

Livestock grazing, and recreation are the only resource outputs which generate economic activity in this WSA. The WSA currently produces 5,975 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

The economic value of existing outputs amounts to $45,052 annually and local personal income generated by existing outputs amounts to $49,832 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 137,220 acres of public land to the National Wilderness Preservation System (NWPS). Wilderness designation would preserve the wilderness characteristics of Coyote Rim and the other rims with raptor habitat, a plant species of special interest, and the broad expanses of gently rolling, sagebrush covered hills and plateaus.

Wilderness designation under this alternative would maintain or improve the natural qualities of the area as well as the outstanding opportunities for solitude. Closure of 19 vehicle ways totaling approximately 71 miles would improve naturalness of the area by eliminating most vehicle use and allowing the ways to revegetate. Closing the ways would also improve opportunities for solitude and the quality of primitive recreation by reducing motor vehicle use within the area. (If there were no practical alternatives to use of vehicles by livestock operators, they would be allowed to continue to use vehicles on a limited basis.)

Development of mineral resources on inholdings and construction of access across public lands to the inholdings could adversely affect wilderness values in the area. All of the inholdings are in areas with a moderate potential for the occurrence of minerals.

The **enhanced wilderness alternative** would add 141,880 acres to the NWPS, assuming 4,660 acres of private and split-estate inholdings and adjacent parcels could be acquired. The effects of this alternative are similar to the all wilderness alternative. However, the enhanced wilderness alternative would prevent the possible development of the scattered split-estate and private lands within the WSA through acquisition of these lands.

Closing the 23 miles of dead-end roads (and 71 miles of vehicle ways) would eliminate vehicle use in the area and improve the manageability of the WSA by preventing vehicle intrusion on solitude. The closure would also allow the roads to revegetate, thus improving the apparent naturalness of the area.

Under the **no wilderness/no action alternative**, wilderness values and special features of the entire WSA would be subject to disturbance from proposed developments as well as possible development of mineral resources or development along the proposed utility corridor.

Proposed livestock and wildlife improvements would adversely affect the naturalness of the area since all proposed surface disturbing projects such as pipelines, reservoirs, and vegetation manipulation projects (brush control and crested wheatgrass seedings) would be allowed. Other possible activities such as mining or the development of the utility corridor could further affect the natural character of the area.

Opportunities for solitude would be adversely affected in the area as a result of any additional vehicle access and use for new projects, possible mining operations or development of a utility corridor.

The raptor habitat identified as a special feature would not be protected within the study area. This feature would also be subject to disturbance from the development of other resources.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development: 137,220 acres under the **all wilderness alternative**, and 137,220 acres, plus an additional 4,660 acres if private and split-estate land is acquired, as proposed under the **enhanced wilderness alternative**.

Included in the withdrawal under each of these alternatives would be the acreage rated moderate for the occurrence of metals, which encompasses the entire WSA, and 62,815 acres rated moderate for diatomite.

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Vegetation

Areas designated wilderness would not be subject to most surface disturbing activities. Vegetation dependent upon the existing undeveloped environment would thus be maintained.

Under the **all and enhanced wilderness alternatives**, the proposed water developments might or might not be allowed, depending on a site-specific assessment of whether they conform with Wilderness Management Policy. If allowed, and areas were grazed more intensely as a result, vegetative composition could be affected. The rate of succession toward the late-seral stage would probably be lessened, and the communities would likely remain at the mid-seral stage.

Under the **no wilderness/no action alternative**, the proposed brush control and seeding of 22,530 acres would temporarily remove sagebrush from the sagebrush/bunchgrass community resulting in reduced vegetation diversity. The addition of crested wheatgrass (a non-native species) to that community would create a bunchgrass/crested wheatgrass community.

The proposed water developments would also be allowed under the no wilderness/no action alternative resulting in the changes discussed under all and enhanced wilderness alternatives.

The federal candidate species of special interest would receive the same protection as federally listed threatened or endangered species.

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness.

Under both the **all and enhanced wilderness alternatives**, the proposed brush control and water development to benefit antelope would not be allowed, foregoing the opportunity to increase antelope numbers.

With closure of ways under the all wilderness alternative and closure of roads and ways under the enhanced wilderness alternative, one of the two wildlife guzzlers in the WSA would have to be abandoned, because routine maintenance of this structure on foot or on horseback would be too time-consuming. This would reduce water availability for wildlife and cause a slight decline in animal populations. The other guzzler is near a boundary road where access is good.

Under the **no wilderness/no action alternative**, the brush removal and seeding to provide habitat for increased antelope numbers would be developed, and maintenance of all existing wildlife structures would continue. Burning on 7,000 acres would provide an herbaceous cover preferred by antelope. This would further increase antelope numbers in the WSA. Proposed livestock improvements would also be allowed under this alternative and could result in improved habitat and increased populations of some wildlife (primarily antelope) from the increased water availability and changes in forage types. There would be no significant impacts to other wildlife populations in the study area. However, changes in livestock use and distribution in portions of the South Steens allotment could occur, improving wildlife habitat and increasing populations outside the WSA.

Effects on Livestock Grazing

Under the **all and enhanced wilderness alternatives**, the proposed brush control and seedings in the South Steens and Beatys Butte allotments would not be allowed. Up to 6,330 AUMs (4,450 in the South Steens and 1,880 in the Beatys Butte allotment) would be foregone. The benefit/cost ratio of the brush control and seeding project in South Steens allotment is less than 1:1, and the benefit/cost ratio of the project in the Beatys Butte allotment is unknown.

The structural projects proposed in the WSA might or might not be allowed under the all and enhanced wilderness alternatives, depending on a site-specific assessment of whether they conform to Wilderness Management Policy. If none of the projects are allowed, improved livestock distribution and opportunities for better livestock management would be foregone. Increases in licensed use of 400 AUMs in the South Steens allotment and 525 AUMs in the Beatys Butte allotment would be foregone. In addition, forage which would be used to forestall possible decreases in licensed use of up to 1,360 AUMs in the Pueblo-Lone Mountain allotment would also be foregone if all proposed projects in the allotment are not allowed.

The benefit/cost ratio of the structural projects in the South Steens allotment is greater than 1:1, unknown in the Beatys Butte allotment, and less than 1:1 in the Pueblo-Lone Mountain allotment.

In total, if all brush control and seedings and structural projects were not allowed, 7,255 AUMs of additional forage for the South Steens and Beatys Butte allotments would be foregone, along with 1,360 AUMs in the Pueblo-Lone Mountain allotment which would be used to forestall possible decreases in licensed use of up to 1,360 AUMs.

The Basque Hills WSA is one of four WSAs located within the Pueblo-Lone Mountain allotment. Water developments are proposed in all four of the WSAs and fences and seedings are proposed in the Rincon and Pueblo Mountains WSAs. Those projects are designed to shift livestock use from apparently overgrazed portions of the Rincon and Pueblo Mountains WSAs, and areas outside of the WSAs, to areas with unused grazing capacity in the Rincon, Basque Hills and Hawk Mountain WSAs.

Preliminary and inconclusive range survey data show that grazing in portions of the Pueblo-Lone Mountain allotment, including portions of the Rincon and Pueblo Mountains WSAs, could exceed the grazing capacity by 4,000 AUMs (approximately 19 percent of the total licensed grazing use in the allotment), while other portions of the allotment involving much of the Rincon, Basque Hills, and Hawk Mountain WSAs, are not grazed at all due to lack of water and fences to keep livestock confined to those areas. The preliminary estimate of the amount of overgrazing is subject to refinement as the effects of livestock grazing are monitored.

A grazing system is proposed, to protect and enhance the rangeland and wilderness resources, and the proposed developments including those in the Basque Hills WSA are needed to implement the system. Under such a system, pastures are developed and some are rested or deferred each year to allow the forage plants to regain vigor. Each pasture will require fencing and sufficient water to support livestock use. The grazing system also requires sufficient available forage to allow one or more pastures a period of rest during the course of a year. The development of range improvements is necessary not only to offset a possible reduction in livestock use but to provide sufficient forage to allow for implementing the grazing system.

Under the all wilderness alternative, ways would be closed, and under the enhanced wilderness alternative, the interior roads as well as the ways would be closed. Since they are used frequently by the grazing operators, closing them would create some problems for operators. Motor vehicles are used for distributing salt within the WSA.

Under the **no wilderness/no action alternative**, all of the proposed range developments in the Basque Hills study area would be allowed, producing forage through brush control and seeding and making forage available by providing water and improving management. In the South Steens and Beatys Butte allotments, the 7,255 AUMs produced may be licensed if it is sustainable and all forage needs in the allotment have been considered. In the Pueblo-Lone Mountain allotment the additional forage would contribute 1,360 AUMs to forestall a potential reduction of up to 4,000 AUMs of licensed use allotment-wide.

Effects on Utility Corridor Routing

Under the **all and enhanced wilderness alternatives**, the proposed east-west utility corridor could not be located within the WSA. The alternative corridor location around the WSA would be 4.4 miles longer. This would increase costs by $1,201,000 to $1,671,000, depending on type of line design, and increase annual costs by some $65,000 to $127,000. (See Statewide EIS volume for explanation of these figures.)

The **no wilderness/no action alternative** would allow for location of the utility corridor across the north end of the WSA, as proposed.

Effects on Recreation Use

The quality of and opportunities for primitive recreation in the study area would be maintained or improved under the **all and enhanced wilderness alternatives**. Improvements would be a result of eliminating vehicle use on ways under the all wilderness alternative, and on ways and dead-end roads under the enhanced wilderness alternative. Closing two dead-end roads in addition to the vehicle ways, would further reduce the impact of vehicle use on primitive recreation.

The all wilderness alternative would substantially reduce, and the enhanced wilderness alternative would eliminate, vehicle-oriented recreation in the area, mostly affecting hunting for deer and antelope. Some of the loss of visitor days from restrictions on vehicle-oriented hunting would be offset by increased use from hunters who do not use vehicles as a means of transportation within their hunting areas. Because existing use of the area for primitive recreation is limited, it is not expected that such use of the area would substantially increase. Any increase in primitive recreation use would not be sufficient to offset the reduction in vehicle-oriented recreation. There would be a net reduction in overall recreation use in the WSA under the all and enhanced wilderness alternative. Possible slight increases in recreation use resulting from increased wildlife populations from proposed wildlife and grazing improvements may be foregone under the all and enhanced wilderness alternatives.

Under the **no wilderness/no action alternative**, primitive recreation would be subject to continued disturbance by existing vehicle access routes and use (although vehicle use in the area for recreation or other purposes is not substantial). Primitive recreational activities would be further disturbed by proposed range and wildlife projects.

Vehicle-oriented recreation could benefit from additional access associated with the development of range improvements. Additionally, hunting would benefit from increased deer and antelope populations resulting from additional habitat and water sources provided by livestock and wildlife improvements projects, providing a slight net increase in overall recreation use in the study area. Adjustments in livestock grazing due to projects which would be allowed under this alternative could increase wildlife populations and, in turn, increase recreation use throughout the Pueblo-Lone Mountain allotment. Increases in recreation use would be slight in the Basque Hills WSA, but could be important in other portions of the allotment.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 5 and 6. Table 5 shows the effects on economic value and table 6, the effects on local personal income. It is not known at this time whether individual proposed structural developments for this WSA would be constructed if the area were designated wilderness. It is known that vegetative manipulation projects, such as the proposed burn to control sagebrush, would not be allowed.

The column for the wilderness alternatives shows

Table 5. Effects of Alternatives on Annual Economic Value, Basque Hills WSA (OR-2-84) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +2,285	+8,615
Adjustment [2]	AUM	-1,360	-1,360
Big game hunting [3]	RVD	0	+256
Upland game hunting [3]	RVD	0	+5
VALUE OF PLANNED INVESTMENTS [4]			
Grazing	$	0 to +17,229	+64,957
Big game hunting	$	0	+5,809
Upland game hunting	$	0	+157
Total [5]	$	0 to +17,229	+70,923
Investments [6]	$	0 to -16,829	-72,927
Net Economic Value	$	0 to +400	-2,004
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS			
Grazing:			
Adjustment	$	-10,254	-10,254
Reduced access [7]	$	-244	0
Total	$	-10,498	-10,254
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS			
All categories [8]	$	-10,498 to -10,098 (-244 to +453)	-12,258 (-1,707)

[1] Expected future increases due to range improvement investments.

[2] Adjustment for possible reduction in grazing is based on inconclusive data and may not be necessary.

[3] Expected future increases from proposed wildlife and livestock projects.

[4] Vegetative manipulation projects involving up to $696,260 total expenditures, and a structural project involving $208,8 70. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[5] Detail may not sum to "Total" due to rounding.

[6] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[7] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

[8] See footnote 2. If the grazing adjustment is found to be unnecessary, compensating improvements would not be developed. Investments and grazing adjustments would be zero. The effects of this case are shown in parentheses.

Table 6. Effects of Alternatives on Local Personal Income, Basque Hills WSA (OR-2-84) (1981 price levels)

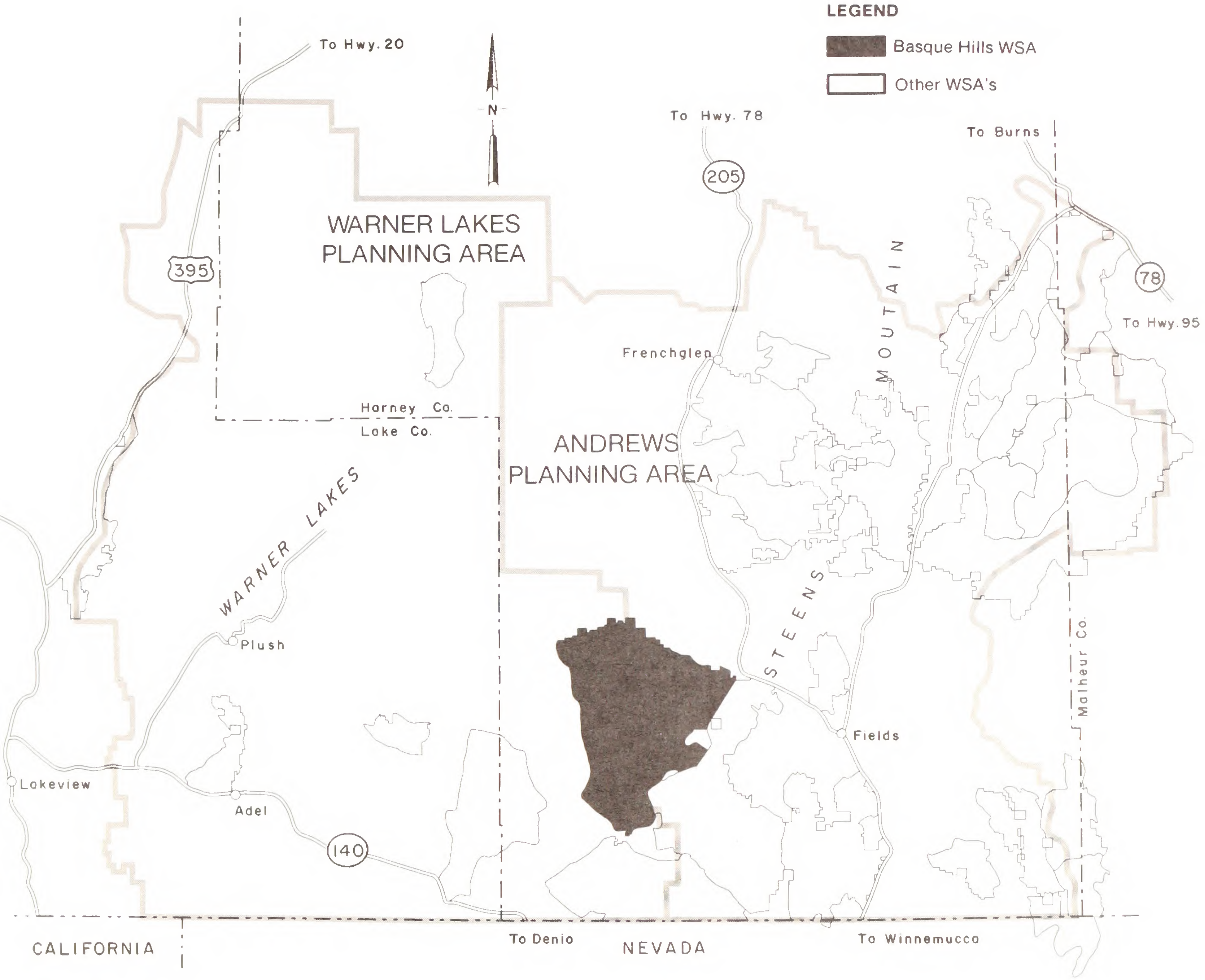
Item	Unit of Measure	All Wilderness, Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +2,285	+8,615
Adjustment [2]	AUM	-1,360	-1,360
Big game hunting [3]	RVD	0	+256
Upland game hunting [3]	RVD	0	+5
INCOME FROM PROPOSED INVESTMENTS [4]			
Grazing	$	0 to +19,125	+72,108
Big game hunting	$	0	+2,542
Upland game hunting	$	0	+77
Construction Activity [5]	$	0 to +28,005	+121,360
Total [6]	$	0 to +19,125	+74,727
INCOME FROM OTHER EXPECTED OUTPUT CHANGES			
Grazing:			
Adjustment	$	-11,383	-11,383
INCOME FROM ALL OUTPUT CHANGES			
All categories [7]	$	-11,383 to +7,742 (0 to +7,742)	+63,344 (+63,344)

[1] Expected future increases due to range improvement investments.
[2] Adjustment for possible reduction in grazing is based on inconclusive data, and may not be necessary.
[3] Expected future increases from proposed wildlife and livestock projects.
[4] Vegetative manipulation projects involving up to $696,260 total expenditures, and a structural project involving $208,870. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[5] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.
[6] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 5.
[7] See footnote 2. If the grazing adjustment is found to be unnecessary, compensating improvements would not be developed. Investments and grazing adjustments would be zero. The effects of this case are shown in parentheses.

the effects as a range of values dependent upon whether structural improvements, and/or grazing operator access, were allowed.

Currently, vehicles are used for livestock management in the study area. The enhanced wilderness alternative would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $244 per year.

Bonneville Power Administration and Pacific Power & Light would incur higher costs under the all wilderness and enhanced wilderness alternatives as a result of rerouting the utility corridor around the WSA.



U. S. Department of the Interior
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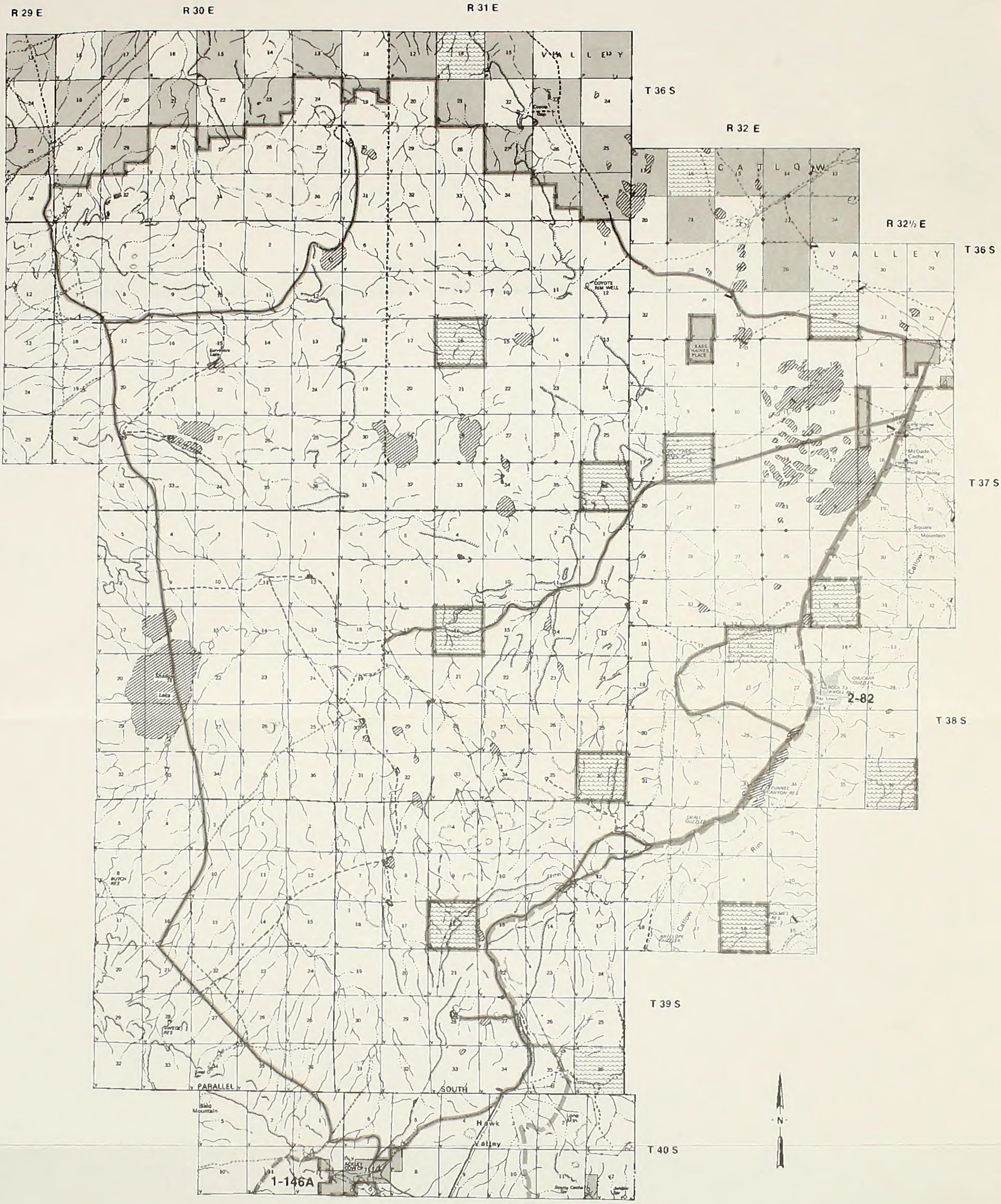
Burns/Lakeview Districts

Basque Hills WSA
OR-2-84

LOCATION MAP

10 0 10 MILES

MAP 1



U. S. Department of the Interior
Bureau of Land Management
Burns/Lakeview Districts

Basque Hills WSA
OR-2-84

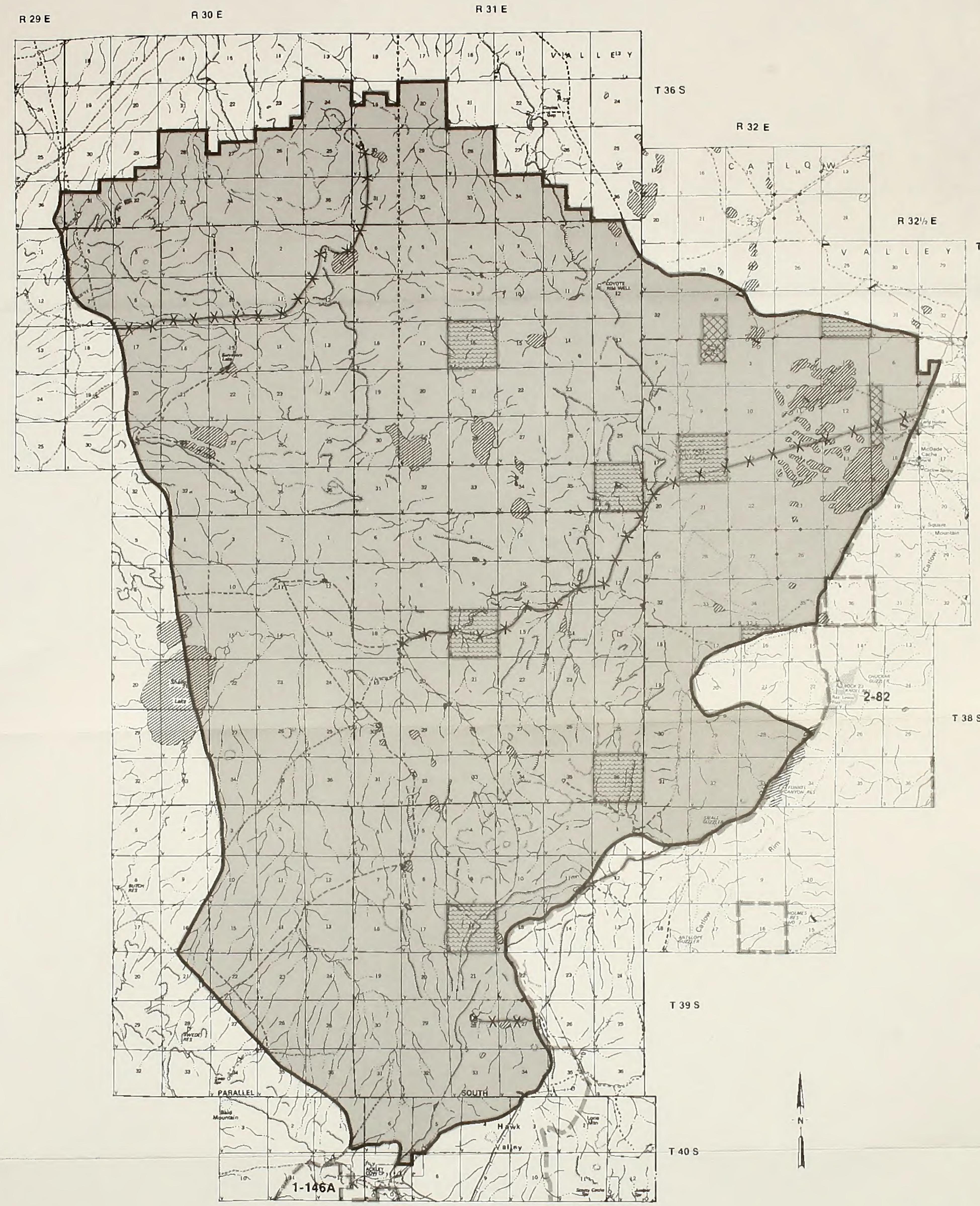
LAND OWNERSHIP

1 0 1 2 MILES

LEGEND

- ▬ Wilderness Study Area Boundary
- ╍ Boundary of Adjacent Wilderness Study Areas
- ☐ Bureau of Land Management
- ■ Private
- ▤ BLM Surface-State or Private Subsurface (Split Estate)

MAP 2



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Basque Hills WSA
OR-2-84

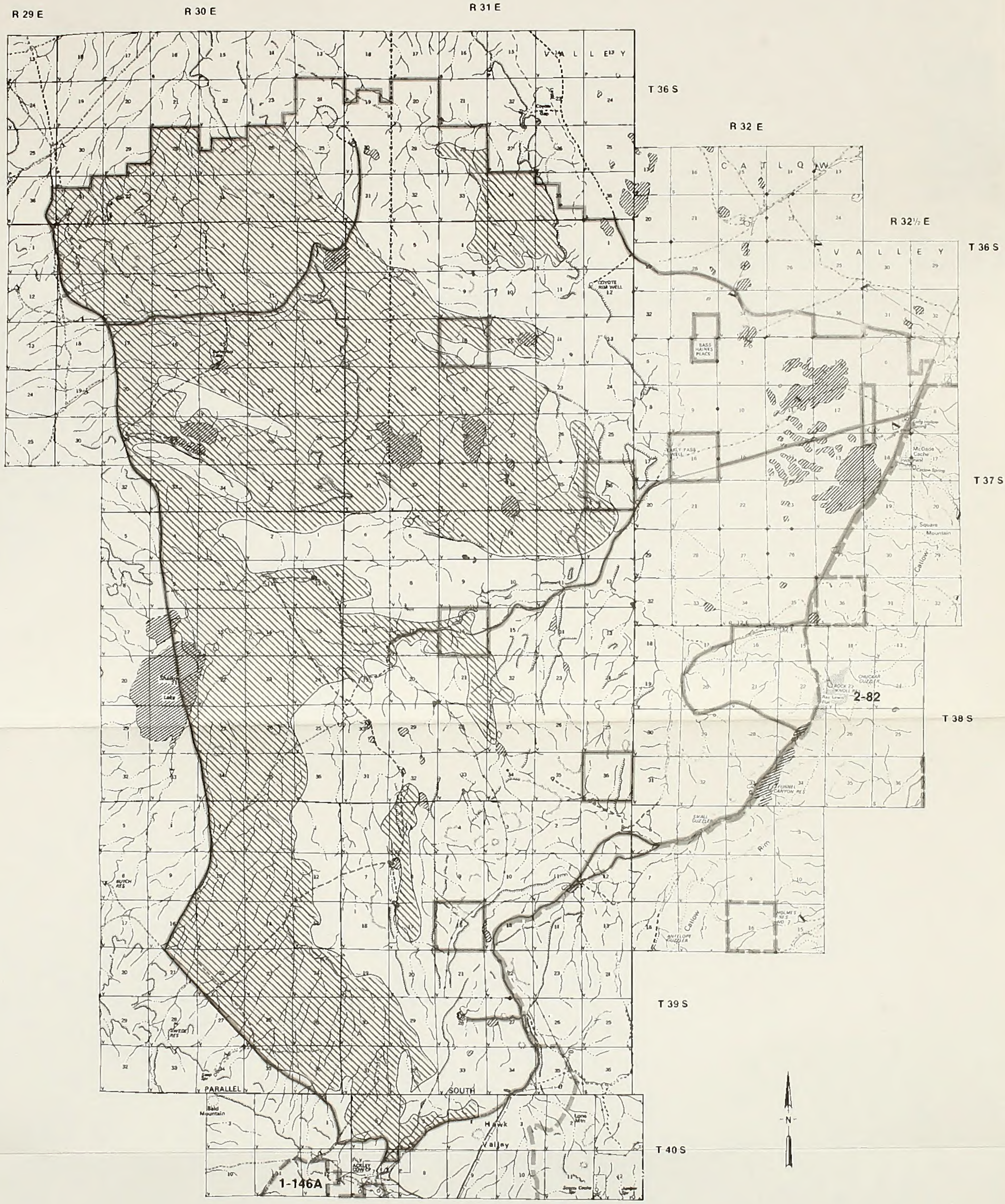
ENHANCED ALTERNATIVE

1 0 1 2 MILES

LEGEND

- ▬ Wilderness Study Area Boundary
- ╌ Boundary of Adjacent Wilderness Study Areas
- ▢ Recommended Suitable for Wilderness
- ▩ Non-Federal Land within Recommended Wilderness
- ▨ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness
- X-X Recommended Road Closure

MAP 3



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Basque Hills WSA
OR-2-84

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4

Entire WSA:
Medium Potential
(3A) for Mercury, Copper and Gold

▨ **Medium Potential**
(3A) for Diatomite

Basque Hills WSA, OR-2-84. The southern end of Catlow Valley looking west from the northeastern corner of the study area. Within the area recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. This view shows one of the playa lakebeds in this portion of WSA and Coyote Rim (on the horizon) on the west side of Catlow Valley. August 1983.

Basque Hills WSA OR-2-84. The middle of the Basque Hills portion of the study area looking north. Within the area recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternatives. The rolling hills common in this part of the WSA add to the opportunities for solitude. The light colored area near the horizon on the right is Catlow Valley. August 1983.

Basque Hills WSA, OR-2-84. Aerial photo of Fish Fin Rim in the north central portion of the area looking west. The area is recommended as suitable for wilderness under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. August 1983.

Basque Hills WSA, OR-2-84. Fish Fin Rim on the northwestern corner of the study area. Within the area suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. A large monolithic rock outcropping, this jagged feature rises from a hillside to a height of 30 to 50 feet. May 1981.

Appendix to the Wilderness Environmental Impact Statement for Oregon

High Steens (OR-2-85F) and Little Blitzen Gorge (OR-2-86F) Wilderness Study Areas

General Description of the Study Area

The High Steens and Little Blitzen Gorge wilderness study areas (WSAs) are located approximately 60 miles southeast of Burns in Harney County. The WSAs are 20 miles east of Frenchglen and the nearest highway, Oregon State Highway 205 (see map 1).

The High Steens WSA contains 65,420 acres of public land (see map 2). In addition, the study area contains seven inholdings of both split-estate and private land totaling 2,405 acres. Only 240 acres of the inholdings are split-estate land. The area is long, about 20 miles, and somewhat narrow, 9 miles, and runs north to south along the length of the mountain.

The Little Blitzen Gorge WSA contains 9,240 acres, all of it public land. It, too, is long and somewhat narrow averaging about 8 miles in length and 2 miles in width. The Little Blitzen Gorge WSA is oriented east to west, as it follows a western flowing drainage from the top of the mountain.

The boundaries of the two study areas are formed by a combination of private land, split-estate (federally managed surface, subsurface mineral rights not federally owned) land, and BLM roads.

Both study areas are bordered for 14 miles by a well-maintained, heavily used BLM road, the Steens Mountain Loop Road. The High Steens WSA is on the east side of the road or the "outside" of the loop, and the Little Blitzen Gorge WSA is on the west side of the road or the "inside" of the loop. The Loop Road was constructed and is maintained by BLM and receives substantial use during the summer months, especially in the upper elevations by sightseers and other recreationists who use it as access to reach the backcountry. The Little Blitzen Gorge is an integral part of Steens Mountain but, because of the placement of the road, it is the only one of the major gorges that is not at least partially within the High Steens WSA. In addition to being physically similar to the other gorges on the mountain, the Little Blitzen Gorge is also a major recreation attraction and provides one of the prominent views from the main ridge of the Steens.

A portion of the eastern boundary of the High Steens is formed by a section of a county road which runs along the base of the mountain. Both private and split-estate land make up the majority of the boundary for both of these study areas.

Also forming part of the boundary in the High Steens WSA are 10 dead-end roads totaling 14 miles. Four of these roads lead to split-estate and private lands which actually form part of the WSA boundary but are surrounded by public land. These parcels include two sections of private land totaling 920 acres, one 435-acre parcel of split-estate and one section of state land totaling 430 acres.

The High Steens and Little Blitzen Gorge wilderness study areas contain a variety of physical features which are the result of volcanism, faulting, glaciation, and erosional processes. The two WSAs lie atop the high, main ridge of Steens Mountain, the highest mountain in southeastern Oregon.

There are several prominent physical features within the High Steens WSA. Throughout its entire length, the study area includes the high main ridge of the mountain. Near the central portion of the study area is the summit which reaches a height of 9,733 feet. This point is actually located on a parcel of state land which forms part of the study area's boundary. The highest point in the study area on public land is only 3 feet lower and is about 2 miles to the north at the Steens Mountain overlook.

From the top of the ridge, the east side of the mountain drops rapidly to the east into the Alvord Desert Basin. The elevation difference along this eastern face of the mountain is generally greater than 4,000 feet. At one point however, the elevation drops as much as 5,300 feet within about 3 1/2 miles. It is along the eastern boundary that the WSA reaches its lowest elevation at 4,080 feet.

The eastern portion of the mountain is deeply carved by numerous drainages and is characterized by steep, rugged, rocky escarpments and ridgelines. Ten drainages on this eastern slope originate from spring flows and nearly perennial snow fields near the mountain summit. From north to south these drainages include Mann, Castle Rock, Little McCoy, Mosquito, Willow, Cottonwood, Big Alvord, Little Alvord, Pike, and Indian Creeks. Glacial action has carved portions of the upper ends of many of these drainages leaving small "U" shaped basins with meadows of lush vegetation at high elevations along the eastern slope.

West of the Steens Ridge, in the High Steens WSA, is the more gently western sloping portion of the Steens Mountain fault block. Although major portions of the study area contain this gently rolling high plateau, much of this area has been deeply cut by glaciers, and huge U-shaped glaciated gorges are the dominant features of the landscape.

Kiger Gorge, the largest and perhaps the most well known of these gorges, lies on the northern end of the study area. Averaging over one mile from canyon rim to canyon rim, this gorge reaches a depth of more than 2,000 feet. The steep rugged, rocky canyon walls which surround the gorge on three sides, slope abruptly to the lush valley floor and Kiger Creek which drains the area to the north. Much of the canyon bottom is privately owned.

Four other major gorges also dominate the upper elevations of the High Steens. Wildhorse and Little Wildhorse Creeks drain the study area to the south while Big and Little Indian Creeks drain the area to the west.

The northwestern and southwestern portions of the WSA are generally flat to gently rolling areas typical of the western slope of the Steens.

The Little Blitzen Gorge WSA is dominated by one major feature, the deep canyon of Little Blitzen Gorge. One of the six major glaciated drainages on the mountain, begins just west (less than l/4 mile) of the Steens Mountain ridgeline at an elevation of 9,200 feet. Like the other gorges, the Little Blitzen Gorge is U-shaped and is characterized by steep rocky canyon walls around the perimeter on three sides and thick vegetation in portions of the canyon bottom. The gorge averages about one mile in width and ranges from 800 to 1,200 feet in depth.

The Little Blitzen River which drains the area to the west, is a perennial stream fed by numerous springs and contains several waterfalls. The lowest elevation in the WSA, 5,400 feet, occurs along the river where it leaves the study area on the western boundary.

Above the rim of the gorge on the north and the south, the study area contains portions of the gently sloping western plateau of the Steens. Within these parts of the study area are a few scattered perennial ponds and several small spring-fed drainages which flow into the gorge.

Both study areas contain a wide variety of vegetation, largely due to the extreme differences in elevation. Some species are widely distributed while others are restricted to small, isolated areas. In both study areas, riparian vegetation occurs within most of the drainages and near springs, including cottonwood trees and groves of aspen. Grasses and alpine wildflowers are dominant near the summit and on the more gentle western facing slopes.

Sagebrush occurs throughout the study areas. Mountain mahogany and juniper occur on the very steep rocky slopes such as the side walls of the gorges or in the steep drainages on the eastern side of mountain.

Interrelationships

The two study areas are adjacent to three other WSAs. On the east the High Steens WSA is separated from the Alvord Desert WSA (OR-2-74) by a segment (less than one mile) of county road which runs from the Folly Farm area (State Highway 78 on the north) to Fields and on to Denio. This is a major access route in the county serving a wide variety of users. A notable interrelationship between the High Steens and the Alvord Desert WSAs is that they share one of the primary views of the Alvord Desert from the summit of the mountain.

On the west, the South Fork of the Donner und Blitzen River study area (OR-2-85G), is separated from the High Steens WSA by a road maintained by BLM and grazing operators. This road serves private landowners, BLM personnel, and hunters, as well as grazing operators.

On the northwest a road also separates the Little Blitzen Gorge WSA from the Blitzen River study area (OR-2-86E) along a mile of its length. The road serves as access to private lands along the north side of the gorge. A parcel of private land divides this common boundary into two 1/2-mile segments.

The Steens Mountain Recreation Lands cover all of the public lands within the Little Blitzen Gorge WSA and most of the lands in the High Steens WSA. This area was designated by BLM in 1971, in cooperation with local groups and government entities as well as private landowners, to manage the area under a multiple-use concept while protecting the existing natural condition of the mountain. Only a small amount of land on the perimeter of the High Steens study area is not included within this designation.

Within the study areas, there are five sites designated as Research Natural Areas (RNAs) while much of the mountain has been designated as an Area of Critical Environmental Concern (ACEC) (see map 3). The Research Natural Area designation is intended to protect these areas for research and education.

Three of the RNAs fall within the High Steens WSA: the East Kiger Plateau RNA, the South Fork Willow Creek RNA, and the Little Wildhorse Lake RNA.

Management of the RNAs includes the following:

- minimizing surface disturbing activities detrimental to the plant communities and certain species;

- prohibiting introduction of exotic (non-native) plants and animals; and

- authorizing research and educational use by permit only.

The East Kiger Plateau RNA contains 1,240 acres and is on the high elevation lands east of Kiger Gorge in the northern portion of the WSA. The RNA designation protects a community of high elevation fescue grassland in excellent condition.

The South Fork Willow Creek RNA provides protection for alpine communities within two habitat types. The 227-acre area is located in a glacial cirque just below the Steens ridgeline.

The Little Wildhorse Lake RNA is located at the upper end of Little Wildhorse Canyon in the southcentral part of the study area. This RNA protects a pristine high elevation lake and includes 240 acres of public land.

Two RNAs fall mostly within the boundaries of the Little Blitzen Gorge wilderness study area. Covering most of the upper end of the gorge is the Little Blitzen RNA, containing 2,539 acres and designed to protect a number of plant species of special interest and 6 plant communities or habitats in good condition.

At the other end of the canyon, near the western edge of the study area, is the Rooster Comb RNA, covering 720 acres and providing protection for a mountain mahogany community and a black cottonwood riparian area.

Most of both study areas and some adjacent lands are included within the Steens Mountain ACEC. Covering 50,500 acres, the ACEC was designated to protect the scenic, botanical, and wildlife values on Steens Mountain. As of January 1, 1985, specific management objectives for the ACEC were not defined.

These special management areas (RNAs and ACEC) would remain as official designations whether or not the WSAs are designated wilderness. Because of their locations in the higher elevations of the mountain, some of the RNAs and part of the ACEC may not require specific actions or restrictions to provide for their protection.

Current plans for the Little Blitzen RNA call for the construction of a fence along its western boundary in order to prohibit livestock use of this sensitive portion of the gorge. It is not expected that any of these special management areas would be withdrawn from mineral entry if they were not designated as wilderness. However, the general management of these areas would include establishing mitigation measures as authorized by BLM surface protection regulations (43 CFR 3809) to minimize the impacts of mineral exploration and development.

A portion of the Desert Trail crosses part of the High Steens WSA, and is planned to cross additional land in both areas. Although the specific route has yet to be determined, the planning effort is underway. BLM and the Desert Trail Association have joined in a cooperative management agreement to share responsibilities for developing and maintaining the trail. The trail is part of the Oregon State Recreational Trails System.

The Oregon Department of Fish and Wildlife (ODFW) conducts aerial surveys of bighorn sheep, deer, and antelope on the east side of Steens Mountain. These surveys are done annually using a helicopter. ODFW conducts another annual population count of sage grouse, but these counts are done using vehicles. ODFW is also responsible for law enforcement with respect to hunting and fishing in the areas. This is an important program because of the amount of recreational use that occurs in the areas. Law enforcement in the Steens relies on the use of both aircraft and predominately vehicles.

ODFW also uses helicopters to stock Lahontan cutthroat trout in Wildhorse Lake near the top of the mountain. These fish are stocked on an as-needed basis to maintain the recreational value of the lake. The streams along the east side of the mountain are stocked by helicopter with another fish, Whitehorse cutthroat trout, to expand its range. This fish is endemic to only two streams in the Trout Creek Mountains but may have been part of a larger population or subspecies which originally inhabited the ancient lake that filled the Alvord Basin. The streams which have been stocked include Little McCoy, Mosquito, Willow, Cottonwood, Big Alvord, Little Alvord, and Pike Creeks. Mosquito Creek was stocked in 1971 and all others were stocked in 1980. Both Willow Creek and Big Alvord will be stocked in 1984. Once the streams have a viable population, they may not be stocked again.

These eastside streams and the larger drainages of Big Indian and Little Indian Creeks and the Little Blitzen River are also the subject of fish studies conducted primarily by BLM in conjunction with ODFW. The purpose of these studies is to assess and monitor aquatic habitat through fish populations. Helicopters are the primary means of access to most of these streams, but vehicles are also used.

Also, in the High Steens WSA, the U.S. Fish and Wildlife Service conducts a predator control program to reduce predator damage to cattle by aerially shooting coyotes. The program is conducted on an as-needed basis (usually every other year) primarily in the foothills along the eastern side of the mountain.

The southwestern edge of the High Steens WSA is in the South Steens wild horse herd management area (HMA). HMA management will not be significantly affected by any of the alternatives.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for these WSAs include:

- potential mineral exploration and development in the WSAs,

- existing vehicle use in the WSAs and the effects of eliminating vehicles under wilderness designation on other types of recreation and multiple uses in the WSAs,

- potential increased recreation use as a result of wilderness designation, particularly effects of increased use on the areas' wilderness values and other features (BLM's Wilderness Management Policy states that recreationuse would be managed to protect the areas' wilderness values. Such management protection would also extend to the other resource values which are present within this area.),

- potential increases or improvement in livestock grazing planned for the WSAs,

- other special designations in the WSAs, such as Research Natural Areas, the Area of Critical Environmental Concern, and the Steens Mountain Recreation Lands (Wilderness designation would not change these other designations but would likely create a need for revision of the associated management plans.),

- management of wild horses in the areas (see Statewide EIS volume),

- the numerous plant species of special interest found within these study areas,

- the population surveys being conducted in the WSAs (Use of vehicles during sage grouse brood counts might be restricted or prohibited under wilderness designation. If conducting these counts on horseback or foot were too costly, the counts may be stopped and sage grouse data collection areas relocated or reduced, thereby reducing the reliability of data used in setting hunting regulations), and

- existing fish stocking programs in the WSA (Fish stocking is allowed under wilderness designation, so the issue is not addressed further in the appendix).

Also raised as an issue the possibility of combining these study areas with adjacent WSAs on the Steens to form one large wilderness, and the effects of closing a portion of the Steens Mountain Loop Road in order to combine the High Steens and Little Blitzen Gorge WSAs. Another issue concerned whether the WSAs were manageable as wilderness with their present configurations.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- preferred alternative
- partial
- no wilderness/no action

The enhanced wilderness alternative does not analyze the possible combination of the High Steens and Little Blitzen Gorge WSAs with any of the adjacent study areas. Combining the High Steens with the Alvord Desert WSA on the southeast by closing the road between them would not be feasible. The boundary road shared by these two study areas is less than one mile in length and is a major county road. It provides access to the southern end of Harney County along the eastern side of Steens Mountain and is well maintained and well traveled.

Combining the High Steens WSA with the South Fork of the Donner und Blitzen study area to the southwest is also not feasible. Although the road which separates the two study areas is not good, it does provide access to private and other lands on the western side of the mountain. This road forms a common boundary for the two WSAs for less than one mile and closing it would not result in a substantial improvement in the manageability or wilderness values of either study area.

The same is true of combining the Little Blitzen Gorge and the Blitzen River study areas on the west; closing a short section of road between the areas would not make a difference in manageability or wilderness values of these areas.

All Wilderness

The all wilderness alternative would recommend all 65,420 acres of the High Steens WSA and all 9,240 acres of the Little Blitzen WSA suitable as wilderness (see map 2). They would be managed as two separate wilderness areas. For purposes of analysis under this alternative, it is assumed the dead-end roads which enter the High Steens WSA would remain open and none of the private, state or split-estate lands within the area would be acquired.

Enhanced Wilderness

Under the enhanced wilderness alternative, a portion of the High Steens WSA and all of the Little Blitzen Gorge WSA would be combined and 63,170 acres of public land would be recommended as suitable for wilderness: 53,040 acres in the High Steens WSA, an additional 720 acres of public land adjacent to the west side of the High Steens WSA, 9,240 acres in the Little Blitzen Gorge WSA, and an additional 170 acres of public land outside of the Little Blitzen Gorge WSA on the north side (see map 4).

In addition, an attempt would be made to acquire 7,460 acres of private, state and split-estate inholdings and boundary parcels. These parcels could be acquired through purchase or exchange with willing landowners and include 5,830 acres of private land, 430 acres of state land and 1,200 acres of split-estate land. With the exception of some parcels which are located in the bottom of Kiger Gorge, most of these parcels occur around the perimeter of the study area. Their acquisition would improve the manageability of the study area (particularly around the boundary) and contribute to the area's wilderness values.

Assuming acquisition of the private, state, and split-estate lands and addition of 890 acres of public land, total area recommended suitable under this alternative would be 70,630 acres.

A 7-mile section of the Steens Loop road would be closed to combine the two WSAs into a single wilderness area. Also, all or part of three dead-end roads, totaling 2 miles in length, would be closed.

As part of the enhanced wilderness alternative, 12,380 acres of public land would be recommended as nonsuitable for wilderness, all of it in the High Steens WSA. Most of the lands are located on the southeastern and southwestern portions of the WSA, although there are small parcels scattered along the western and northern boundary.

The boundary of the wilderness under this alternative would be substantially different from the WSA boundaries. The Steens Loop Road would be closed along the southern boundary of the Little Blitzen Gorge study area from the intersection of the Loop road with the road to Wildhorse Lake, near the mountain's summit, west to the overlook above Big Indian Gorge. This would allow for a one mile dead-end road to the Big Indian overlook on the west and a 7-mile dead-end road to the summit of the mountain near the center of the wilderness. The dead-end road to the top of the mountain would provide for continued vehicle access to the major scenic overlooks at Kiger Gorge, the east rim, Wildhorse Lake and to radio facilities at the summit.

The boundary along the north side of the Little Blitzen Gorge WSA, with acquisition of adjacent private land, would follow a road which parallels the north side of the canyon. Boundary adjustments in the northwestern and northern portions of the High Steens WSA would be along legal subdivisions.

The eastern boundary in the northern portion of the High Steens would also be adjusted with the acquisition of private lands. The southern part of the eastern boundary would follow a contour line. Following a small drainage just north of Little Alvord Creek, the boundary would follow the drainage until it reached the 5,200 foot level, following this contour until it intersects Little Alvord Creek. South of Little Alvord Creek the boundary would be drawn along the 5,600-foot contour level to Pike Creek, the 6,000-foot contour to Indian Creek, and the 6,800-foot level to the ridge overlooking Wildhorse Creek. From this point, it would follow the ridge down until it intersected with a portion of the existing WSA boundary along a legal subdivision. In general, the boundary would conform not only with contour elevations but some form of physical feature, in most cases, the edges of small 'benches' along this part of Steens mountain.

The portion of the study area recommended as nonsuitable was eliminated from consideration because of potential manageability problems. The southeastern corner would be difficult to manage as wilderness because of the possibility that mining claims would be determined to contain discoveries of valuable minerals before designation of the area as wilderness.

The southeastern corner of the WSA contains several mines (some of which may have valid rights and "grandfathered" uses), a number of mining claims, three dead-end roads leading to mining activity areas and a network of old vehicle ways created by prospectors. Because of the existing mines and their potential for continued development (before or after possible wilderness designation), this part of the study area would be difficult to manage as wilderness.

On the southwest another portion of the High Steens study area would be recommended as nonsuitable for wilderness. On this side of the area, the boundary would be along the western rim of Wildhorse Creek Canyon.

The land in this part of the WSA is recommended as nonsuitable because it would be difficult to manage. This portion of the study area is bounded almost entirely by private land along legal subdivisions which are not well marked.

Because this area of the WSA is isolated from other parts of the WSA and because of the long-standing history of vehicle use by hunters in the area, it would be difficult to enforce a vehicle closure if the area were included in a wilderness area.

Only relatively minor adjustments would be made to the remainder of the western boundary. Some private and split-estate land would be acquired, some public land not in the WSA would be included in the wilderness, and a small amount of BLM land in the WSA would not be included in the wilderness.

Under this alternative, the small boundary adjustments (both adding and deleting acreage) around the perimeter of the WSAs would help to improve the identification of the boundary and the ability to locate (survey) the boundary more easily. The large adjustments recommending the southeastern and southwestern portions of the WSA as nonsuitable would reduce potential manageability problems.

The recommended acquisition of private and split-estate land within the area would improve manageability, solitude, and recreation by eliminating possible restrictions on the movement of visitors within the area and by eliminating the potential for development on these lands.

Use of the lands recommended as nonsuitable for wilderness under this alternative would be the same as under the no wilderness/no action alternative.

Preferred Alternative

Under the preferred alternative, portions of both WSAs would be combined and 41,210 acres of public land recommended suitable for wilderness: 34,220 acres of the High Steens study area, an additional 720 acres of public land adjacent to the west side of the High Steens WSA, and 6,270 acres of the Little Blitzen Gorge WSA (see map 5). An attempt would be made to acquire 3,240 acres of private, state, and split-estate land through purchase or exchange with willing landowners, including 1,590 acres of private land, 410 acres of state land and 1,020 acres of split-estate land in the High Steens WSA, and 90 acres of private land and 130 acres of split-estate land in the Little Blitzen Gorge WSA.

Assuming acquisition of these parcels and addition of the public land adjacent to the High Steens WSA, the total area recommended suitable under this alternative would be 44,450 acres.

A 6-mile section of the Steens Mountain Loop Road would be closed to combine the two areas into a single wilderness area. Also, a portion of two dead-end roads (totaling 1 mile in length) along the southeastern boundary would be closed to vehicles.

The preferred alternative would recommend 34,170 acres of public land nonsuitable for wilderness: 31,200 acres in the High Steens and 2,970 acres in Little Blitzen Gorge. A number of boundary adjustments would improve the overall manageability of the area and reduce conflicts with competing resource values.

On the northwestern corner of the Little Blitzen Gorge WSA, the boundary would follow the northern and eastern rim of the canyon, avoiding most of the private lands which occur along the boundary road while still providing an identifiable boundary and including features of the gorge.

After encircling the upper end of Little Blitzen Gorge, the boundary would cross the South Loop Road about one mile west of the intersection with the roads to Wildhorse Lake and the East Rim Overlook. South of the loop road, the boundary skirts the upper end of Big Indian Gorge and Wildhorse Canyon, excluding the radio facility and the road leading to it, and turns north following the edge of the Steens rim. The boundary follows the rim until it reaches Kiger Gorge where it would then follow the western rim of the gorge.

The upper-elevation flat land near the top of the mountain which is excluded by this boundary configuration, would not be recommended for wilderness so that recreationists could continue to drive vehicles on designated spur roads extending off from the Main Steens Loop Road. The area currently receives a large amount of such use and is in accordance with BLM's Steens Mountain Recreation Plan. In addition, leaving this part of the mountain out of the wilderness would allow BLM to accommodate potential future increases in visitor use by providing facilities.

The Loop road would be closed for 6 miles along the ridge separating the two study areas, beginning where the boundary crosses the road from the Little Blitzen Gorge to Big Indian Gorge. From this point west, the road would be closed to the overlook at Big Indian near the western boundary. As with the enhanced alternative, a 1-mile portion of the Loop road to the overlook would remain open to vehicle use.

The flatter land west of Kiger Gorge would also be recommended as nonsuitable for wilderness. This area has a limited number and range of wilderness values. It has a large amount of adjacent unmarked private land and a private inholding. Also, the livestock operator needs to use a vehicle way for livestock management in this area.

From the western rim of Kiger Gorge, the boundary turns east, along a legal subdivision, to join with the eastern rim. Following the east rim for a short distance to the south, the boundary would again turn east following Mann Creek downstream to the eastern side of the WSA.

The land not recommended as suitable on this northern end of the area includes the northern extension of the east rim of Kiger Gorge and a block of land north of Mann Creek. Both of these parcels extend away from the bulk of the WSA, are surrounded on three sides by unmarked private land, and can only be partially identified by physical features.

On the eastern side of the High Steens, the boundary would turn south from Mann Creek at the 5,800-foot elevation level near the base of the east rim, following this contour until it reached Cottonwood Creek, then following the 5,200-foot level south to Little Alvord Creek. This boundary would be more easily identifiable then the WSA boundary, and it would avoid an irregular configuration along private land.

The remainder of the southeastern, southern and southwestern boundaries are the same as those under the enhanced alternative. Following several contour lines and physical features, the southeastern boundary would exclude an area with existing mineral development and the potential for additional development which could result in manageability problems.

The lands on the southwest would also be difficult to manage because of the long-standing practice of using vehicles in the area to hunt, and because of a private inholding, adjacent unmarked private land, and difficulties in reaching the area from the rest of the WSA.

The remainder of the western boundary follows a combination of physical features (the western ridge of Wildhorse and Little Wildhorse Canyons), legal subdivisions and a portion of the Steens Mountain Loop Road.

As with the enhanced alternative, existing land uses that would continue on the lands not recommended as suitable under this alternative would be the same as under the no wilderness/no action alternative.

Partial

The partial alternative would recommend as suitable the same acreages as under the preferred alternative, but the two WSAs would be managed as separate wilderness areas. The boundaries of the two areas would be identical to those in the preferred alternative except the South Loop road would continue to be the boundary between the two wilderness areas. None of the road would be closed to vehicle use.

As with the enhanced and preferred alternatives, an attempt would be made to acquire the private, state and split-estate lands within the area recommended suitable through purchase or exchange with willing owners.

This would be the same acreages as under the preferred alternative, and assuming acquisition of these parcels and addition of the public land adjacent to the High Steens WSA, total area recommended suitable under this alternative would be 44,450 acres.

The partial alternative would protect wilderness values of the areas, but would allow unrestricted access to the top of the mountain. Vehicle access along the upper section of the South Loop road would not be constrained as a result of wilderness designation under this alternative.

The land uses which could occur on the areas not recommended for wilderness would be the same as those in the no wilderness/no action alternative.

No Wilderness/No Action

The no wilderness/no action alternative would recommend both WSAs nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The areas would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued availability for mineral exploration and development,

- construction of a fence along the western side of the Little Blitzen RNA to protect the values identified in the area,

- continued use of vehicles for recreation and livestock management, except as restricted in the recreation management plan. (Vehicle use of the high elevation portion of the South Loop (the same section proposed for closure under the enhanced wilderness and preferred alternatives) could be restricted or eliminated under the no wilderness/no action alternative, if the road could not be adequately maintained or if there were resource problems related to its use; and

- construction of a proposed livestock improvement project (a spring development).

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Areas as Wilderness

Both the High Steens and Little Blitzen Gorge WSAs would be manageable as wilderness under the all wilderness alternative. However, management problems could occur as a result of irregular and unidentifiable boundaries with private land, the presence of private and split-estate inholdings, and existing (and potential for future) development of mineral resources in areas where mining claimants may have valid rights.

There could be potential management problems with identification of boundaries in both study areas, but this would be especially common in the High Steens WSA. Most of the boundary for this area is irregular and follows legal subdivisions with private land. These boundaries are not easy to identify on the ground, and survey work and signing or fencing would be extremely costly. This is also true of the private and split-estate inholdings.

Management problems could also occur as a result of existing use of the area by vehicles. This is especially the case in the southwestern corner of the High Steens area where hunters have long used vehicles to gain access to this part of the WSA and adjacent lands. Existing vehicle ways in the area provide access routes on which use would be difficult to control.

Although there are no plans for future development, the entire area of both WSAs has moderate to high potential for the occurrence of minerals. Depending on the extent of development (minerals or otherwise) and the need for access to the

Table 1. Summary of Proposed Management Under Each Alternative, High Steens (OR-2-85F) and Little Blitzen Gorge (OR-2-86F) WSAs

Proposed Management	All Wilderness	Enhanced Wilderness	Preferred	Partial	No Wilderness/ No Action
Acres Designated as Wilderness	74,660	63,170	41,210	41,210	0
Acres Closed to ORVs by Wilderness Designation	74,660	63,170	41,210	41,210	0
Miles of Roads Closed	0	9	7	1	0
Miles of Ways Closed	26.5	19	11	11	0
Acres of Full Fee Estate Acquired[1] [2]	0	6,260	2,090	2,090	0
Acres of Split Estate Acquired [2]	0	1,200	1,150	1,150	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	74,660	63,170	41,210	41,210	
Structural Wildlife Projects Developed:					
Fences (miles)	0-2	0-2	2	2	2
Stream Channel Projects (number) [3]	0-1	0-1	0-1	0-1	1
Structural Livestock Projects Developed:					
Springs (number)	0-1	1	1	1	1

[1] Includes 430 acres of State lands under the enhanced alternative and 410 acres of State land under the preferred and partial alternatives.

[2] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

[3] The project involves the blasting of 25 holes in the stream channel along a 1/4- to 1/2-mile length.

Table 2. Summary of Environmental Consequences of Alternatives, High Steens WSA (OR-2-85F) & Little Blitzen Gorge WSA (OR-2-86F)

Resource or Activity	All Wilderness	Enhanced Wilderness	Preferred Alternative	Partial	No Wilderness/No Action
Wilderness Values	Would add 65,420 acres in High Steens and 9,240 acres in Little Blitzen Gorge to NWPS, as two separate wilderness areas. Maintains or improves wilderness characteristics and protects special features, including Steens Mountain (the highest point in southeastern Oregon); the major glaciation features including the upper end of Kiger Gorge, Little Blitzen Gorge, Big Indian Gorge, and Wildhorse Gorge; the rugged east face escarpment; glacial cirques and lakes; and many perennial streams. The area contains bighorn sheep, several plant species of special interest, unique plant communities, trout species of interest and outstanding scenic quality. Closure of 26.5 miles of ways (5.5 miles already closed by recreation plan) would enhance wilderness values. Development of minerals or other resources on inholdings or construction of access to inholdings could adversely affect wilderness values. The WSAs are generally manageable under this alternative with some manageability problems due to inholdings, the potential for mineral development and unidentifiable boundaries.	Would add 70,630 acres to the NWPS, assuming acquisition of 7,460 acres of private, state and split-estate land and addition of 890 acres of public land. Combines portion of High Steens (53,040 acres) and all of Little Blitzen Gorge (9,240 acres) into one wilderness area. Includes all of the features identified under the all wilderness. Improves wilderness qualities by recommending closure of 7-mile stretch of Steens Loop Road and 2 miles of dead-end roads. Closure of 19 miles of ways (in addition to those already closed under the recreation plan) would also enhance wilderness values. Improves manageability by acquisition of inholdings and boundary parcels. Recommends as nonsuitable for wilderness 12,380 acres, all in the High Steens WSA, for improved boundary identification and to avoid potential manageability problems.This includes some areas of trout habitat and outstanding scenic value. Mineral development could impair those and other wilderness values.	Would add 44,450 acres to NWPS, assuming acquisition of private, state, and split-estate land and the addition of 720 acres of public land. Combines portions of the High Steens WSA (34,220 acres) and Little Blitzen Gorge WSA (6,270 acres) into one wilderness. Includes the features identified under the all wilderness. The wilderness characteristics and special features in this portion of the WSA would be maintained at the present level or enhanced. This area is manageable as wilderness. Closure of the 6-mile section of the Steens Loop Road, 1 mile of dead-end road and 11 miles of ways would enhance wilderness values. Recommends as nonsuitable 31,200 acres in the High Steens and 2,970 acres in the Little Blitzen Gorge WSA. The wilderness values and special features of these areas would be subject to development, including crucial deer winter range, some of the Whitehorse cutthroat trout habitat, and areas of outstanding scenic quality. If mineral development occured, it would adversely affect wilderness values.	Would add 44,450 acres to NWPS, assuming acquisition of 3,240 acres of private, state, and split-estate land, and the addition of 720 acres of public land. includes 34,220 acres from High Steens and 6,270 acres from Little Blitzen Gorge, managed as two separate wilderness areas. Effects same as preferred alternative, except the Steens Loop Road would not be closed.	Wilderness values and special features subject to disturbance from energy or mineral developments; the continued use of vehicles by recreationists, livestock permittees, and BLM; and development of recreation facilities.
Energy and Mineral Development	Development precluded on 65,420 acres in High Steens. This includes 65,420 acres with high potential for metals, 6,106 acres with high potential for geothermal resources and 8,257 acres with moderate potential for bentonite and zeolite. Development precluded on 9,240 acres in Little Blitzen WSA including 7,060 acres with high potential for metals and 2,180 acres with moderate potential for metals.	Development precluded on 63,170 acres, including 890 acres of public land outside the WSA, plus an additional 7,460 acres if private, state, and split-estate land if acquired. This includes 60,990 acres with high potential for metals, 2,180 acres with moderate potential for metals, 1,516 acres with high potential for geothermal and 6,470 acres with moderate potential for bentonite and zeolite.	Development precluded on 41,210 acres, including 720 acres of public land outside the WSA, plus and additional 3,240 acres if private, state and split-estate land is acquired. This includes 39,830 acres with high potential for metals, 1,380 acres with moderate potential for metals, and 3,240 acres with moderate potential for bentonite and zeolite.	Development precluded on 34,940 acres in High Steens WSA, including 720 acres of public land outside the WSA, plus an additional 3,020 acres if private, state, and split-estate land is acquired. This includes 34,940 acres with high potential for metals and 3,240 acres with moderate potential for bentonite and zeolite. Development precluded on 6,270 acres in Little Blitzen Gorge WSA, plus an additional 240 acres if private and split-estate land is acquired. This includes 4,890 acres with high potential for metals and 1,380 with moderate potential for metals.	No impact.

Table 2. (continued)

Resource or Activity	All Wilderness	Enhanced Wilderness	Preferred Alternative	Partial	No Wilderness/No Action
Vegetation	Vegetation preserved. If fences to exclude livestock are not allowed, opportunity to reduce grazing on plants of special interest would be foregone.	Vegetation preserved in suitable area. Otherwise, same as all wilderness.	Vegetation preserved in suitable area. Wildlife fencing project would be built, reducing cattle grazing on plants of special interest.	Same as preferred.	Wildlife fencing project would be built, reducing cattle grazing on plants of special interest.
Wildlife	Wildlife habitat preserved. If spring development and fences to exclude livestock are not allowed, opportunity to improve wildlife habitat would be foregone, along with slight increases in wildlife populations. If proposed stream channel project is not allowed, the opportunity to improve and expand the population of Whitehorse cutthroat trout would be foregone.	Wildlife preserved in suitable area. Spring development would be built improving wildlife habitat and increasing wildlife populations slightly. Otherwise, same as all wilderness.	Wildlife habitat preserved in suitable area. Spring development and fences to exclude livestock would be built, improving wildlife habitat and increasing wildlife populations slightly. If proposed stream channel allowed, the opportunity to improve and expand the population of Whitehorse cutthroat trout would be foregone.	Same as preferred.	Spring development and fences to exclude livestock would be built, and stream project would be implemented resulting in improved wildlife and fish habitat.
Livestock Grazing	Spring development in High Steens WSA might be precluded and opportunity to provide additional forage in the WSA, and protect the spring, and better distribute livestock, might be foregone. A possible increase of up to 208 AUMs of licensed forage could also be foregone. Closure of ways would make it inconvenient for the livestock operators to manage livestock.	Proposed spring development would be built and potential increase of available livestock forage realized. Up to 208 AUMs of forage could be licensed. Closure of portion of Steens Loop Road,in addition to ways would be very inconvenient for the livestock operators.	Same as enhanced.	Same as enhanced, except way closures would not have a significant effect on livestock operators.	Potential increase of 208 AUMs realized.
Recreation Use	Primitive recreation opportunities would be maintained. Current use of motor vehicles for recreation would be restricted to roads. Marginal increases in recreation use if wildlife and livestock projects are built. Overall recreation use would increase.	Closure of portions of Steens Loop Road would adversely affect vehicle-oriented recreation. Primitive recreation opportunities would be maintained. Marginal increases in recreation use from proposed wildlife and livestock developments. Overall recreation use would increase.	Same as enhanced although slightly smaller increase in primitive recreation activities. Marginal increases in recreation use from proposed wildlife and livestock developments. Overall recreation use would increase.	Steens Loop Road would remain open and way closures would not affect vehicle-oriented recreation. Marginal increases in recreation use from proposed wildlife and livestock developments. Primitive recreation is expected to increase, resulting in net increase in overall recreation use.	Primitive recreation would be adversely affected by vehicle-oriented recreation in the High Steens but would be the dominant activity in the Little Blitzen Gorge WSA. Marginal increases in recreation use from proposed wildlife and livestock developments. Overall recreation use would not change.
Economic Value and Local Income	Decreases in annual economic value could range from $73,708 to $71,162, depending on what proposed projects would be allowed in wilderness. Local personal income would decrease from $22,048 to $18,972, depending on the same uncertain factors. Both sets of figures exclude unquantified changes in recreation use. The maximum increase in transportation costs to grazing operators would be $497.	Decreases in annual economic value could range from $46,911 to $45,138, depending on what proposed projects would be allowed in wilderness. Local personal income would decrease by $11,668. Both sets of figures exclude unquantified changes in recreation use. The maximum increase in transportation costs to grazing operators would be $497.	Decreases in annual economic value could range from $34,926 to $34,120, depending on what proposed projects would be allowed. Local personal income would decrease by $8,059. Both sets of figures exclude unquantified changes in recreation use. The maximum increase in transportation costs to grazing operators would be $497.	Same as preferred.	Increase in economic value and local personal income by $2,546 and $3,076 respectively.

inholdings across BLM land, maintaining the wilderness qualities of the surrounding wilderness lands could be difficult. This is the case for the southeastern portion of the High Steens WSA. Under wilderness management, mining operations which occur in the area and which were found to have valid existing rights upon designation of the area as wilderness could be expanded and impair wilderness qualities. Continued or expanded mining operations could make it difficult to maintain the wilderness values of this portion of the study area.

The enhanced wilderness, preferred and partial alternatives all attempt to reduce the potential management problems of the study areas. Wilderness designated under any of these alternatives would also be manageable but would not be without problems.

Under the enhanced wilderness alternative, the minor boundary adjustments would improve the location and identification of the boundary, and acquisitions of inholdings would reduce or eliminate potential problems with recreation use or development. This alternative would also reduce problems with existing vehicle-oriented recreation on the southwest and potential increased mineral development on the southeast, although manageability problems would still be present.

The preferred and partial alternatives also would reduce potential problems with recreation use and mineral development through acquisition of inholdings, though fewer acres would be involved. Boundary problems with private land would still exist but would be substantially reduced as a result of the adjustments along the northern and eastern sides of the High Steens WSA.

Rationale for Selection of the Preferred Alternative

The preferred alternative recommends that a large portion of the highest mountain in southeastern Oregon be designated as wilderness. Portions of the two study areas recommended as suitable for wilderness contain the majority of this highly scenic and ecologically unique mountain. This includes high, sharp ridgelines and peaks, portions of high alpine meadows, deep glacial gorges, and a steep east-facing escarpment which rises over one mile above the Alvord Basin to the east. Also included within the preferred boundary are plant and animal species of special interest and plant communities common only to alpine areas, an unusual situation for a desert mountain. The area has a large number and variety of wilderness qualities. It is in a basically natural condition, offers outstanding opportunities for solitude and primitive types of recreation, and contains a large number of unique, special wilderness features.

All of the area recommended as suitable for wilderness has been identified as having moderate to high favorability for the occurrence of certain minerals. Although this is a major conflict, designation of this part of Steens Mountain is the most appropriate use of these lands. The wilderness values of this portion of the High Steens and Little Blitzen Gorge WSAs outweigh the potential mineral values which could be gained from resource development.

Portions of the two study areas were recommended as being nonsuitable for wilderness under the preferred alternative because of conflicts with other resource uses, because of manageability problems, and because of the need to improve the location of the boundary. Although both of the WSAs have high to moderate mineral potential, the potential for mineral development is particularly high in the southeastern corner of the High Steens study area, which contains a number of mining claims and small mining operations. There is a possibility that a valuable mineral discovery could be made on the claims before the area was designated wilderness, giving the mining claimants a right to develop their claims regardless of the effect on wilderness values. If such development were to occur, it would not be possible to preserve wilderness values in the vicinity of the mines, access roads, and related facilities.

The southwestern portion of the High Steens also has potential manageability problems. Vehicle-oriented recreation is a common activity on this part of the mountain and would be difficult to control in this area due to the presence of several vehicle ways (vehicle routes established and maintained solely by the passage of vehicles) and the relatively flat terrain. This area also contains a parcel of private land, is nearly surrounded by private land on unidentifiable legal boundaries, and would be difficult for visitors to get to from the bulk of the study area. All of these factors contribute to potential management problems which override the area's limited number of wilderness characteristics.

The northwestern part of the High Steens study area has a limited number of wilderness characteristics. It would be recommended as nonsuitable for wilderness because the benefits of preserving those characteristics would be outweighed by the benefits of allowing uses -- such as the use of vehicles by livestock operators -- which would conflict with wilderness preservation. Unsurveyed and unmarked boundaries with private land and an inholding also would make this part of the WSA difficult to manage as wilderness.

Portions of the top of the mountain would be recommended as nonsuitable for wilderness because the benefits of leaving that area open to the use of vehicles by recreationists on dead-end roads extending off from the Steens Loop Road would outweigh the benefits of preserving the area's wilderness values.

Affected Environment

This section discusses only those activities or resources which influence the character of the study areas, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The High Steens WSA and the Little Blitzen Gorge WSA appear to be in an outstanding natural condition. None of the man-made features within the study areas are very noticeable.

The majority of the developments in the High Steens WSA occur in the southeast corner of the study area. There are 28 ways totaling 27 miles, 4 water developments, 11 fences totaling 9 miles, and several locations of mining activity which include 3 cabins. It is estimated that approximately 4 percent of the study area is influenced by these features. (The area of influence is an estimate of the acreage in the WSA from which these man-made features can be seen.)

There is a concentration of ways in the southeast corner of the WSA, but the rough topography reduces the influence of the developments on the naturalness of the area. Topographic relief minimizes the influence of ways on the west side of the rim. At present approximately 4 miles of ways (not shown on maps for this appendix) are closed to motor vehicles under the Steens Mountain Recreation Plan.

Of the 9 miles of fences in the WSA, none of the fences is longer than 1 1/2 miles. All of the fences are screened by topography and vegetation and have a minimal visual influence on the area.

The four water developments are concentrated in the southeast corner. Two are developed reservoirs and two are developed springs. All four are small and unnoticeable. The rugged topography is the primary screening factor.

There are several places in the southeastern portion of the study area where there are substantial mining scars. One of the mines has a small tramway built on the hillside which was used to remove ore-bearing rock. The mining activity occurs along Little Alvord Creek, Pike Creek, Dry Creek and Indian Creek. In general, these scars influence only a relatively small portion of the WSA, due to their location within canyons or on east facing slopes away from higher elevations from which they can be viewed.

Three cabins occur near the mining activity; one older cabin sits north of the Weston Place on Indian

Creek and the other places are on Pike Creek and Little Alvord Creek. All three are in the bottom of drainages and they can be seen only from the immediate vicinity.

The most noticeable outside sights and sounds are the boundary roads and the traffic on them. On the east face of the Steens, there are 11 miles of dead-end roads winding up the creek drainages. They have minimal influence on the surrounding area, due to the steep topography of the drainages. On the top of the mountain, there are 3 miles of dead-end roads that are used by sightseers. One road leads to the radio facility on top of the mountain. This tower and the roads are substantially unnoticeable from inside the WSA. Only from the rim, just above the road, can the development be partially seen. This road is well traveled in the summer by sightseers and fishermen to Wildhorse Lake. The other small road leads to the overlook of Kiger Gorge. It is also well traveled during the summer months.

There are numerous roads, ways, and other developments within a couple of miles of the study area boundary that can be seen from certain high locations. The locations are high above and a substantial distance from the developments, so the influence of the outside sights on the visitor's perception of the naturalness of the WSA is slight.

The Little Blitzen Gorge WSA has very few man-made features. There are 5 vehicle ways totaling 5 miles, 1 reservoir, 1 trail and remnants of 4 cabins and a corral. It is estimated that approximately 7 percent of the area is influenced by these features.

The vehicle ways are seldom used and barely noticeable. Currently, 1 1/2 miles of ways (not shown on maps for this appendix) are closed under the recreation plan. The only reservoir is small and substantially unnoticeable.

A trail used by hikers and horseback riders runs along the river and up two drainages on the north rim of the gorge. These trails are screened by topograghy or vegetation which reduces their visibility.

The four historic cabins and corral are in the bottom of Little Blitzen Gorge. These structures are rapidly deteriorating since they are no longer used. They are of historic interest and enhance the study area.

Outside sights and sounds, primarily from the boundary roads, have only a slight effect on the study area. Approximately two-thirds of the WSA boundary is formed by the Steens Mountain Loop Road which is heavily used during the summer months (July, August, and September). The road itself influences only small portions of the study area.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The High Steens and Little Blitzen Gorge WSAs offer outstanding opportunities for solitude.

Opportunities for solitude in the High Steens WSA are enhanced by the varied and rugged topography. The extreme difference in elevations is the major screening factor. It is possible in many places in the WSA to be within a half mile of a boundary road or dead-end road and feel totally isolated. The gorges of Kiger Creek, Wildhorse, Little Wildhorse, Big Indian, Little Indian, and the other drainages provide excellent opportunities for isolation from all other parts of the WSA and boundaries. The east side of the study area is completely screened from the west side because of the steep escarpment.

Vegetative screening also enhances opportunities for solitude in some areas. Aspen, willow and other riparian species in the canyons provide screening within the immediate vicinity of the creeks. Junipers growing on the steeper slopes provides some screening. However, the study area as a whole does not contain enough vegetation to significantly enhance opportunities for solitude.

The long and narrow shape of the Little Blitzen Gorge WSA is not conducive to solitude. However, the unusual topographic features provide opportunities for solitude. Nearly all of the study area has topographic screening.

The majority of the vegetative screening occurs along the river corridor. Tall stands of black cottonwood and aspen grow along Little Blitzen River and combine with mountain mahogany and aspen growing farther upslope away from the river to provide excellent opportunities for solitude. The plateau area above the gorge has large thickets of aspen, providing opportunities for solitude where it is not provided by the topography.

Opportunities for primitive recreation in the High Steens and Little Blitzen Gorge WSAs are outstanding. The primitive recreation activities include day hiking, backpacking, horseback riding, hunting, fishing and sightseeing.

Opportunities for day hiking are outstanding in both WSAs. In the High Steens WSA, the east side provides many interesting and rugged drainages to hike. Very few of these canyons are easily accessible from the top of the mountain, but nearly all of them are accessible from the mouth of the canyons at the lower elevations. Wildhorse Creek and Willow Creek provide very challenging hikes. Kiger Rim and the gorges on the west side, Little Indian Creek, Big Indian Creek and McCoy Creek, also provide day hiking opportunities.

In Little Blitzen Gorge WSA, the bottom of the gorge provides the best day hiking opportunities. Water, vegetation and wildlife are all abundant and are attractive features. Three established trails with varying degrees of difficulty provide access routes to the bottom. Overall, this area provides challenging routes for the hiker.

Opportunities for backpacking abound in both WSAs. The High Steens WSA offers the most variety of areas in which to backpack. The eight major canyons on the east, the Wildhorse Canyons, Kiger Gorge and the west gorges all contain spectacular scenery, ranging in variety from lush canyon bottoms to the towering rock escarpments, and provide excellent places to backpack. Level camping spots are numerous in all but the canyons on the east face. These contain level spots, but they are limited to the creek flood plain, and the small glacial cirques at the head of the creeks where flat areas are much more abundant. A portion of the Desert Trail running from Big Indian Canyon down Little Wildhorse and Wildhorse canyons provides an excellent backpacking opportunity.

Many of these same trails and routes can also be used by horseback riders. However, the opportunities would be limited to those routes which are not as steep and difficult.

In Little Blitzen Gorge WSA, backpackers and horsebackers would use the same areas as day hikers. Level camping areas exist all along the creek bottom. Water is abundant, but it requires purification. The trails are suitable for horseback riding.

Game species which can be hunted in the High Steens WSA include mule deer, antelope, bighorn sheep, elk, and upland game birds. The entire area is in deer, elk, and antelope summer range, providing opportunities for hunting all of these animals. Chukar hunting is best on the lower east face of the Steens where excellent habitat exists.

Mule deer is the only game species in the Little Blitzen Gorge which provides hunting opportunities. Deer populations are large enough for good hunting throughout the area.

Opportunities for fishing are outstanding in both WSAs. In High Steens WSA, there is fishing for redband trout in Big Indian Creek, Kiger Creek, McCoy Creek, and their tributaries. Rainbow trout and Lahontan cutthroat trout occur in Wildhorse Creek, and Wildhorse Lake is stocked with Lahontan cutthroat trout. In Little Blitzen Gorge WSA, the Little Blitzen River is managed for wild trout. Fishing opportunities for redband trout are excellent.

Sightseeing and photography opportunities abound in these WSAs. In the High Steens WSA, the broad vistas include Beaty Butte and Hart Mountain to the west, the Pueblo Mountains to the south and the Alvord Basin, Sheepshead Mountains, and Trout Creek Mountains to the east. Within the study area, the glaciated gorges with their U shapes and the rugged rock escarpments create fascinating views for both sightseeing and photography. The gorge in Little Blitzen Gorge WSA, with its rocky escarpments and rich green bottoms of aspen and riparian vegetation, is very attractive. A different perspective is provided from within the canyon where the rock spires tower above on the narrow canyon walls and aspen groves hang on the steep slopes.

Special Features

The special features of the High Steens and Little Blitzen Gorge WSAs substantially enhance the areas' wilderness values. Geology, vegetation, wildlife and scenic quality are special features of both WSAs. Historical values are a special feature of the Little Blitzen Gorge WSA.

The geology of Steens Mountain is the dominant special feature of the WSAs. Displacement along the northwesterly trending faults has separated the mountain into three distinct topographic units known as Northern Steens, High Steens, and Southern Steens. The High Steens rises along a north-south scarp 5,500 feet above the floor of the Alvord Desert reaching an altitude of 9,733 feet. Bounded on the north and south by northwest-trending fault scarps, the High Steens stands about 2,000 feet above the other two segments of the mountain.

The eastern escarpment of the Steens Mountain exposes a thick succession of volcanic rocks and is a major topographic feature in southeastern Oregon.

Pleistocene glaciers have been the main sculpting agent on the upper part of the High Steens and on the adjacent parts of the northern and southern Steens into which glaciers originating in the High Steens flowed. Kiger Gorge and the canyons of the Little Blitzen River, Big Indian Creek, Little Indian Creek, Wildhorse Creek and Little Wildhorse Creek were all gouged out by valley glaciers that originated within a few miles of the summit of the mountain and flowed down former stream valleys. The heads of the glaciated canyons lie within a distance of about six miles of each other and are accessible by short hikes from the Steens Loop Road and side roads.

The heads of the glaciers are marked by small basins, or cirques. Only thin walls separate the heads of Little Blitzen and Big Indian Canyons from cirques east of the rim. At Kiger Gorge the rim was breached where the head of Kiger glacier met the head of a glacier in the valley of Cottonwood Creek on the east scarp.

Lake basins on the High Steens were formed by glaciation and are of two types. Fish Lake and other smaller lakes nearby are in depressions dammed at the west end by moraines. Wildhorse Lake, in the cirque of Wildhorse Canyon, and Little Wildhorse Lake in the cirque of Little Wildhorse Canyon are glacially eroded depressions in the bedrock.

Little Blitzen Gorge, the primary geologic feature of Little Blitzen Gorge WSA, was carved by glaciers that originated at the top of the Steens fault block and flowed west down a former stream valley. Only a thin wall separates the head of the gorge from the east escarpment of the Steens. Weathered boulders remain from the moraines and are scattered in the canyon and at the mouth of the valley. The deep, narrow U-shaped gorge displays fascinating geologic phenomena.

High Steens WSA and Little Blitzen Gorge WSA each have a high concentration of plant species of special interest. High Steens WSA contains all, or at least substantial portions of the known populations of 27 of 30 plant species of special interest and Little Blitzen Gorge WSA contains 17. The three RNAs in High Steens WSA, the 2 RNAs in Little Blitzen WSA and the ACEC which is partially in both WSAs provide special management for some of the plant species of special interest as well as other vegetation communities. (The vegetation section further discusses these plants of special interest.)

Scenic quality is a special feature common to both WSAs. Little Blitzen Gorge WSA and most of the High Steens WSA contain outstanding scenery.

Several species contribute to making wildlife a special feature in the High Steens WSA. Bighorn sheep range over the east face of the mountain and occasionally may be seen. There is crucial deer winter range on the lower slopes of the escarpment. Whitehorse cutthroat trout, a proposed federally endangered species, was successfully established in Mosquito Creek in 1971. Pike, Little Alvord, Big Alvord, Cottonwood, Willow and Little McCoy Creeks have also been stocked with this trout. Both WSAs contain redband trout, a native fish of special concern because of its limited range.

Steens Mountain, including both High Steens and Little Blitzen Gorge WSAs, is one of only two eastern Oregon locations where pikas are found. Steens Mountain also provides the only eastern Oregon habitat for the northern water shrew. Additionally, the Steens, in these areas, is an important raptor foraging area and raptor nests have been located in both WSAs.

Four old homesteads in the bottom of Little Blitzen Gorge have nearly rotted away, but are still visible. Frank Kuney, a sheep rancher of the 1920's, built a working corral near the principal meadow of the gorge. Today it stands in disrepair, but it was used through the 1960's. These historical features enhance the wilderness values of Little Blitzen Gorge WSA.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the Little Blitzen Gorge and High Steens WSAs are in the Intermountain Sagebrush Province. The potential natural vegetation is saltbush-greasewood, sagebrush steppe, or alpine meadows and communities.

Fifteen of the vegetative communities listed in the Basin and Range section of the Oregon Natural Heritage Plan occur in these WSAs. Nine of them are common to both WSAs. These are big sagebrush/Idaho fescue, big sagebrush on Steens Mountain, mountain mahogany community in the Southern Basin and Range, bitterbrush-sagebrush-snowberry on Steens Mountain, aspen groves, snowbrush and bittercherry community complex, high elevation fescue grasslands, alpine communities on Steens Mountain including snow-deflation and moderate snow-cover communities, and alpine communities on Steens Mountain including downslope snow accumulation areas and upper cirque communities.

There are four ecosystems present in High Steens WSA but not in Little Blitzen WSA. They are big sagebrush/bluebunch wheatgrass, big sagebrush-greasewood, low sagebrush/Idaho fescue, and low sagebrush on Steens Mountain. Communities found only in Little Blitzen Gorge WSA are western juniper/big sagebrush-bitterbrush and black cottonwood riparian area.

The study areas are within 5 hours' driving time of one standard metropolitan statistical area with a population over 100,000: Boise, Idaho.

Energy and Mineral Development

The geology, energy and mineral resources of the High Steens and the Little Blitzen Gorge wilderness study areas were evaluated by interpretation of existing literature, review of mining claim and mineral leasing records and comparison of rock units in the WSAs with similar units in other areas which are known to contain mineral deposits.

Additional information pertaining to the mineral resources of these WSAs came from the State of Oregon Department of Geology and Mineral Industries (DOGAMI), which conducted a geochemical survey of the area. Technical details of the findings of the evaluation are in a BLM report titled "Assessment of Geology, Energy, and Mineral Resources, Steens Mountain Geologic Resource Area, Harney County, Oregon".

The WSAs are within the Steens Mountain geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The southeastern side of the High Steens WSA has a high favorability for geothermal resources. The Alvord Known Geothermal Resource Area (KGRA, a federally-defined area with specific boundaries within which geothermal resources are known to exist) borders the study area on the east. Following legal subdivisions, the KGRA boundary runs along the extreme eastern and southeastern side of the study area at the base of the mountain. Only a relatively small portion of the study area falls within the KGRA boundary. The area rated high for geothermal resources within the WSA follows the same boundary as the KGRA.

As of January 1, 1984, five geothermal leases covering 4,540 acres had been issued in the High Steens WSA. There were no geothermal leases in the Little Blitzen Gorge WSA as of January 1, 1984.

Both WSAs have high to moderate potential for the occurrence of metals. In the High Steens WSA, results of the DOGAMI geochemical survey indicate that the entire WSA is highly favorable for mercury, copper, gold, silver and molybdenum mineralization. Two mines in the Pike Creek Formation have had past production records of minor amounts of mercury. There is also a moderate favorability for the occurrence of bentonite and zeolites near the eastern boundary of the study area.

In the Little Blitzen Gorge WSA, the DOGAMI geochemical survey showed anomalies of zinc, copper, mercury, nickel and cobalt in the stream sediments of the Little Blitzen River. The majority of the WSA has been rated highly favorable for these metals, while the far western portion is rated moderately favorable. Mercury, copper, silver, molybdenum, zinc, nickel and cobalt are strategic and critical minerals.

Parts or all of 38 mining claims are located within the High Steens WSA, predominantly in the eastern portion of the study area. The mining claims are associated with mercury and uraninum. There were no mining claims in the Little Blitzen Gorge WSA, as of January 1, 1984.

As of January 1, 1984, there were 19 oil and gas leases covering 60,793 acres in the High Steens WSA. In the Little Blitzen Gorge WSA, 2 oil and gas leases cover 5,223 acres.

Table 3 shows the mineral potential classifications in the two WSAs. Map 7 shows the portions of the WSAs rated high or moderate (medium) for certain minerals, as well as the portion of the KGRA within the WSA.

Table 3. Classification of Energy and Mineral Potential, High Steens WSA (OR-2-85F) and Little Blitzen Gorge WSA (OR-2-86F)

Commodity	Area	Classification Level	Confidence Level
Metals (mercury, copper, silver, gold, molybdenum)	2-85F; Part of 2-86F [1]	4	D
	Remainder of 2-86F [1]	3	B
Geothermal	Part of 2-85F [1]	4	D
	2-86F; Part of 2-85F	2	B
	Remainder of 2-85F	1	B
Uranium/Thorium	2-85F	2	B
	2-86F	1	C
Coal	All of both WSAs	1	D
Oil/Gas	All of both WSAs	2	B
Tar sands/Oil shale	All of both WSAs	1	D
Limestone	All of both WSAs	1	D
Diatomite	All of both WSAs	1	C
Bentonite	Part of 2-85F [1]	3	B
	2-86F; remainder of 2-85F	1	C
Zeolite	Part of 2-85F [1]	3	B
	2-86F	1	B
	Remainder of 2-85F	1	C
Sodium	2-85F	2	A
	2-86F	1	B

[1]See map 7

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

The majority of rocks exposed in these WSAs are Tertiary volcanics. In both WSAs, outcrops are predominantly rocks of the Steens Basalt formation is approximately 15 million years old consisting of a thick sequence of thin multiple flows of basalt and andesite.

The oldest of the volcanic formations is the Alvord Creek Formation, in which fossil leaves have been found. This unit outcrops on the eastern side of the High Steens WSA, and does not occur in the Little Blitzen Gorge WSA. Also limited to the eastern side of the High Steens WSA are exposures of the Pike Creek Formation, composed of rhyolitic volcanic rocks which have commonly been associated with mineralization. Several mining claims and mineral occurrences are located near this formation. Quaternary alluvial deposits are scattered throughout both WSAs, but are mainly present along the eastern edge of the High Steens WSA.

Vegetation

There is a wide variety of plant communities in the High Steens and Little Blitzen Gorge WSAs due to the varied topography. The gorges and canyons, the high elevation slopes and the steep east face all contain different complexes of communities. The following communities occur in both High Steens and Little Blitzen Gorge WSAs.

Riparian zones occur along the stream bottoms of the gorges as well as along the many small feeder streams. The dominant species include alder, black cottonwood, willow, rose, chokecherry, and aspens. Many species of sedges, rushes, grasses, and forbs occur along the streams. The estimated successional stage is mid to late seral. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) The climax vegetation is not clearly known but surely includes the shrub species previously mentioned as well as many species of grasses and forbs.

Western juniper and big sagebrush form a community on the rocky lower elevation sites above the stream bottoms. The estimated successional stage is late seral. The probable major climax species are big sagebrush and bluegrass.

A big sagebrush/bunchgrass community occurs on the slopes above the riparian zones. The estimated successional stage is late seral. The major climax species are bluegrasses, needlegrasses, snowberry and big sagebrush.

The steepest portions of the canyon walls and the rocky rims and talus contain a community composed primarily of mountain mahogany. Snowberry and creambush oceanspray are also common. Other species found include Sandberg's bluegrass, needlegrass, squirreltail, big sagebrush and western juniper. The estimated successional stage is late seral and the major climax species is mountain mahogany. Rooster Comb RNA, in the Little Blitzen Gorge study area, provides management and protection for a mountain mahogany community and the associated black cottonwood riparian area.

On the flat western slopes and ridges between the gorges, the community is mountain big sagebrush/grass. In some areas, small pockets of low sagebrush also occur. The estimated successional stage is mid-seral. The primary climax species are western needlegrass, bluegrasses and mountain big sagebrush.

Aspens are the dominant vegetation on the north slope of Little Indian Canyon. They are also scattered throughout the mountain big sagebrush community on the small north exposures. The aspen groves have a limited understory of bluegrasses, mountain bromes, and shade-tolerant forbs. The estimated successional stage of the aspen groves is mid-seral. The major climax species are aspen and the associated shrubs.

On the more exposed ridgetops, at the head of the gorges, and along the east rim of the Steens, the plant community is subalpine grassland. The major species are rough fescue and Idaho fescue. The estimated successional stage is mid to late seral. The primary climax species are rough fescue and Idaho fescue. The East Kiger Plateau RNA, in the High Steens WSA, provides management and protection for a high elevation fescue grassland community.

Meadows are interspersed throughout the riparian zone, the subalpine grasslands and in the cirques of the gorges. The vegetation growing in meadow areas is bluegrasses, sedges, rushes, slender wheatgrass, mat muhly, and a variety of forbs. The estimated successional stage is mid to late seral, and the primary climax vegetation is bluegrasses and slender wheatgrass.

In the High Steens WSA, the complex of vegetation communities on the exposed east side of the Steens, including the slopes of Wildhorse Canyon, is somewhat different from the west side. The drainages are steeper and the area is very rocky. The east face is inaccessible to livestock, so it is relatively undisturbed. The successional stage is estimated to be late seral, and the probable climax species are those currently present.

Two more communities occur at lower elevations in the eastern and southern portions of the High Steens WSA. These are big sagebrush/bunchgrass and western juniper/bunchgrass.

Little Blitzen RNA protects six communities including aspen groves, late-lying snowbed areas, high elevation fescue grasslands, a mid- to high-elevation vernal pond, a stream system originating in the subalpine, and other alpine communities on Steens Mountain including snow-deflation and moderate snow-cover communities. Several plant species of special interest also occur in this RNA. A fence is proposed along the western boundary of the RNA to prevent livestock grazing in the upper end of the gorge.

South Fork Willow Creek RNA protects alpine communities including snow accumulation areas and upper cirque communities. Little Wildhorse Lake RNA protects a pristine high elevation lake. Steens Scenic ACEC contains many communities. It contains glacial cirques and valleys and high mountain lakes, ponds and valleys, all of which provide unique habitats for alpine communities. Many of the plant species of special interest in the WSAs are in the ACEC.

The High Steens and Little Blitzen WSAs contain a significant concentration of plants of special interest, containing all, or at least substantial portions of the known populations for thirty species (mentioned in the Special Features section) uncommon to the Burns District. There is one species in the High Steens WSA, *Castilleja steenensis* (Steens Mountain paintbrush), which is a candidate for federal listing as threatened or endangered. The other plants of special interest are on List 2 of the Oregon Natural Heritage Plan's 'Rare, Threatened, and Endangered Plants and Animals of Oregon.' Table 4 lists these latter type species and in which WSA they are found.

Wildlife

Both the High Steens and Little Blitzen Gorge WSAs have a good variety of wildlife habitat types and a diverse fauna. Glacial cirques, talus slopes, high mountain lakes, ponds and streams and high elevation fescue grasslands are special wildlife habitats found within these WSAs.

The upper elevations of Steens Mountain are prime summer mule deer habitat with a good interspersion of forage, cover and water. The lower slopes on the east side of Steens Mountain within the High Steens WSA are crucial deer winter range.

Antelope range onto the subalpine habitat of the upper elevations of Steens Mountain during the summer. Antelope range yearlong on gentle slopes of the lower foothills on the east side of Steens Mountain.

Rocky Mountain elk range into the WSAs on top of Steens Mountain in the summer, but they are uncommon.

The steeper slopes on the east side of Steens Mountain in the High Steens WSA provide yearlong habitat for an estimated 170 to 200 bighorn sheep. Most of the bighorn use occurs between Wildhorse Canyon and Castle Rock Creek. Occasionally bighorn sheep are seen north to the House Creek area.

At least 11.7 miles of trout habitat are found in the High Steens WSA, and an additional 8.4 miles are in Little Blitzen Gorge WSA. ODFW periodically stocks Wildhorse Lake by helicoper with Lahontan cutthroat trout. Hybrid Lahontan cutthroat-rainbow trout are found in Wildhorse Creek and the lower portion of Little Wildhorse Creek.

In the High Steens WSA, Whitehorse cutthroat trout, proposed for federal listing as an endangered species, were released in Mosquito Creek in 1971, and in Pike Creek, Little Alvord Creek, Big Alvord Creek, Cottonwood Creek, Willow Creek, and Little McCoy Creek in 1980. Fish were still present in Mosquito Creek in 1979. Fish were present in Pike, Little Alvord, Cottonwood and Little McCoy Creeks in 1983. Fish were not present in Big Alvord and Willow Creeks.

Redband trout are found in the Little Blitzen River in Little Blitzen Gorge WSA. These trout are native to the other streams supporting trout in the High Steens WSA, and they are usually abundant.

Riparian habitat is found along 35 miles of stream on public land in the WSAs. In High Steens WSA, most of this is along Wildhorse Creek, Big Indian Creek, and Little Indian Creek. The Little Blitzen River riparian zone occupies a relatively large area. Brewer's sparrow, dipper, robin, yellow-rumped warbler, yellow-breasted sapsucker, and green-tailed towhee, Rufous-sided towhee, MacGillivary's warbler, beaver, wandering garter snake and Pacific tree frog are found along the streams. Beaver utilize the Little Blitzen River.

Upland game birds include sage grouse and chukars. Sage grouse are found on top of the mountain during the summer where there is adequate cover. ODFW does annual sage grouse brood counts in two locations, one in the High Steens and one in the Little Blitzen Gorge WSA. Steep slopes on the east side of Steens Mountain in High Steens WSA have excellent chukar populations.

Tabel 4. Plants Found (denoted by "x") in High Steens WSA (OR-2-85F) and Little Blitzen Gorge WSA (OR-2-86F) which are on List 2 of Oregon Natural Heritage Plan's "Rare, Threatened, and Endangered Plants and Animals of Oregon."

Species	High Steens	Little Blitzen Gorge
Botrychium boreale, northern grapefern	x	
Botrychium lanceolatum, land-leaved grape-fern	x	x
Botrychium lunaria, moonwort	x	x
Botrychium simplex, little grape-fern	x	x
Cymopterus bipinnatus, Hayden's cymopterus	x	x
Gentiana prostrata, moss or pygmy gentian	x	x
Melica stricta, nodding melic		x
Saxifraga Adscendens var. Oregonensis, wedge-leaf Saxifrage	x	

The upper elevations of Steens Mountain receive heavy use by summering raptors. Red-tailed hawks, golden eagles, marsh hawks, prairie falcons, and American kestrels are the most commonly observed species. The most heavily used areas are the big sagebrush and subalpine habitat types. This is an excellent area for viewing raptors. Golden eagles and prairie falcons nest on the cliffs. One prairie falcon nest has been located in the Little Blitzen Canyon, and one golden eagle nest has been found in Wildhorse Canyon.

Common songbirds vary with habitat. In the High Steens WSA, the lower slopes bordering the edge of the Alvord Desert host species such as horned lark, Brewer's sparrow, black-throated sparrow, sage thrasher, and western meadowlark. The subalpine habitat in both WSAs is breeding habitat for Brewer's blackbird, water pipit, rock wren, horned lark, and other species. In 1981, black rosy finch and gray-crowned finch were observed breeding in the subalpine area on Steens Mountain. This is the only area where both species have been observed breeding in the 48 states except for the Bitterroot Mountains in Montana.

Belding ground squirrel, golden-mantled ground squirrel, sage vole, least chipmunk, and northern pocket gopher are common small mammals found on top the Steens in both WSAs. Great Basin pocket mouse, deer mouse, Ord's kangaroo rat, mountain cottontail, and little brown myotis (bat) are species found along the east edge of the High Steens WSA.

Two mammal species uncommon in Oregon, the pika, *Ochotoma princeps*, and the northern water shrew, *Sorex palustris*, are found in both WSAs. The pika is found in talus slopes and only at two locations in southeastern Oregon, Steens Mountain and Warner Rim. The northern water shrew has only been found at one location in southeastern Oregon, on Steens Mountain. A subspecies of tiger beetle, *Cicindela montane chamberlaini*, is endemic to the area.

Two wildlife improvement projects are proposed in the High Steens WSA. Approximately two miles of fencing is proposed along the upper reaches of the McCoy Creek area to control livestock use. This would prevent livestock from drifting to the higher elevations of the Steens and thereby improve the subalpine wildlife habitat.

Fishery improvements are proposed in Cottonwood Creek along the eastern slope of the mountain. The project, to be implemented along a 1/4- to 1/2-mile section of the stream, would involve blasting rock in the stream channel to create up to 25 pools. The project is intended to expand and enhance the habitat necessary to support a viable population of the Whitehorse cutthroat trout. Additional efforts to introduce this uncommon species of trout would be made in Big Alvord Creek and Willow Creek.

Livestock Grazing

Portions or all of seven grazing allotments are within the High Steens WSA and portions of three grazing allotments are within the Little Blitzen Gorge WSA. Table 5 shows the existing and potential livestock use in the two WSAs in AUMs (animal unit month, the amount of forage required by one cow and calf, or equivalent animals, for one month).

Existing livestock developments (among the man-made developments listed in the naturalness section) include 4 water developments and 9 miles of fencing.

A spring development is proposed in the High Steens WSA, to protect the spring, and make water more easily accessible to livestock. This would increase the available forage in the WSA and could result in a possible increase in licensed livestock use of up to 208 AUMs in the Alvord allotment. No range developments are proposed for the Little Blitzen Gorge WSA.

Grazing operators use motor vehicles frequently on some of the ways in the northern and southern portions of the High Steens WSA and on part of the Steens Mountain Loop Road. This access is necessary for salting, livestock monitoring, and hauling horses. Horses are used to move and gather livestock.

Recreation Use

Recreation use in the High Steens and Little Blitzen Gorge WSAs includes hunting, fishing, sightseeing, day hiking, backpacking, camping, and horseback riding. Mule deer, antelope, Rocky Mountain elk, bighorn sheep, and upland game birds are hunted in these WSAs.

Deer trophy hunting is very popular. It is estimated that deer hunting visitor use is high in the High Steens WSA and moderate in the Little Blitzen Gorge WSA. Antelope hunting is poor and accounts for low visitor use in the High Steens WSA.

Table 5. Existing and Potential Livestock Use, High Steens WSA (OR-2-85F) and Little Blitzen Gorge WSA (OR-2-86F)

Grazing Allotment	Total Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs) [1]
High Steens WSA					
South Steens (No. 6002)	21,935	07/16-10/15	7	1,980	0
Otley Bros. (No. 6010)	3,654	06/01-10/31	37	1,370	0
Alvord (No. 6012)	8,803	04/16-06/30	8	312	208
Wildhorse Canyon (No. 6013)	209	06/16-08/31	100	209	0
Andrews (No. 6019)	3,719	04/16-07/15	22	255	0
Mann Lake (No. 6026)	3,600	06/01-06/30	15	305	0
Steens Summit (No. 6004)	0	No Use	24	0	0
Total High Steens	41,920			4,431	208
Little Blitzen Gorge WSA					
South Steens (No. 6002)	21,935	08/01-10/31	2	1,008	0
Fish Creek-Big Indian (No. 6003)	1,410	08/01-10/31	6	205	0
Steens Summit (No. 6004)	0	No Use	75	0	0
Total Little Blitzen	23,345			1,213	0
Totals both WSAs				5,644	208

[1] Increases might or might not result in increased licensed use in the allotment (see narrative).

Bighorn sheep, elk, and chukar hunting occur primarily in the High Steens WSA. Bighorn sheep hunting is excellent. There is a high success rate and these hunters account for low to moderate visitor use. In the fall of 1983, over 30 elk were harvested on Steens Mountain. Hunting pressure was spread out, but a majority of the use occurred in the High Steens WSA. The amount of elk hunting is not known. Chukar hunting is particularly good along the east side of the WSA, and high visitor use is attributed to this activity.

Fishing in the High Steens and Little Blitzen Gorge WSAs accounts for high visitor use primarily in the High Steens WSA, with moderate use along the Little Blitzen River in the Little Blitzen Gorge WSA. Access to many fishing locations is difficult.

Sightseeing and day hiking are very popular activities. Over 20,000 visitor use days per year can be attributed to sightseeing. There are spectacular views throughout both WSAs. Day hiking is commonly associated with sightseeing. Many people hike the short distance from the Steens Loop Road to the east rim for the view. Hiking along Kiger Rim and Wildhorse Lake is also popular.

The highest use area in Little Blitzen Gorge WSA is along the valley bottom where water, vegetation and wildlife are most abundant. Three established trails provide access to the river. At the mouth of the canyon, a trail traverses the slope from the Loop road to the river. This is a quick, easy hike. From Wet Blanket Springs on top of a plateau at the northeastern part of the gorge, another trail switchbacks down a steep slope to Wet Blanket Creek and follows the creek to Little Blitzen River. This is the most popular and heavily used trail. The third trail switchbacks down the escarpment to the river from a cabin on private land near the center of the north rim.

All of the areas used for day hiking are also used for backpacking, camping, and horseback riding. The level of use is not known, but it is substantial and appears to be increasing.

Hunting, fishing and sightseeing are all associated with motor vehicles. Hunters use the roads and ways throughout the area. Fishermen use the Steens Loop Road for access to the most popular fishing areas and then hike. Sightseeing is heavily dependent on motor vehicles. These recreationists commonly drive the entire Steens Loop Road. The short roads to Kiger Gorge, the Steens Rim and Wildhorse Overlook also receive heavy use.

Economic Value and Local Income

Livestock grazing, oil and gas and geothermal leasing, and recreation are the only resource outputs which generate economic activity in the consolidated area. As of January 1, 1984, there were 21 oil and gas leases and 5 geothermal leases on the WSAs.

Economic value and local personal income generated from existing levels of resource outputs of these lands are presented in table 6. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add all 65,420 acres from the High Steens WSA and all 9,240 acres from the Little Blitzen Gorge WSA to the National Wilderness Preservation System as two separate wilderness areas. It would preserve the outstanding physical features and exceptional wilderness values of the High Steens and Little Blitzen Gorge WSAs. Wilderness designation would maintain or improve the natural qualities of the two WSAs, as well as the outstanding opportunities for solitude and primitive recreation and special wilderness features. These include geological features such as the U-shaped gorges and glacial cirques, outstanding scenic quality, several plant species of special interest, areas of raptor use, populations of pikas and northern water shrew, bighorn sheep habitat, crucial deer winter range, and Whitehorse cutthroat trout.

Closure of 23 miles of vehicle ways in the High Steens WSA and 3 1/2 miles of ways in the Little Blitzen Gorge WSA would improve the naturalness of the area by eliminating most vehicle use, and allowing the ways to revegetate and become less noticeable. It would also prevent new ways from occurring as a result of cross-country vehicle use. At the present time, 5.5 of the 32 miles of ways in the two study areas are closed and 2.5 miles are restricted by seasonal closures under the Steens Mountain Recreation Plan. Some of the ways probably would continue to be used as necessary for maintaining existing livestock facilities on a limited basis.

Table 6. Economic Value and Local Personal Income Generated Annually, Existing Program, High Steens (OR-2-85F) and Little Blitzen Gorge (OR-2-86F) WSAs (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	5,644	$42,556	$47,071
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil and Gas Leases	Acres	66,016	66,016	19,881
Geothermal Leases	Acres	4,540	7,195	2,167
Total			115,767	69,119
High Steens WSA				
Grazing	AUM	4,431	$33,410	$36,955
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil and Gas Leases	Acres	60,793	60,793	18,308
Geothermal Leases	Acres	4,540	7,195	2,167
Total			$101,398	$57,430
Little Blitzen Gorge WSA				
Grazing	AUM	1,213	$9,146	$10,116
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil and Gas Leases	Acres	5,223	5,223	1,573
Total			$14,369	$11,689

None of the inholdings would be acquired under this alternative, and mining of minerals on the inholdings could adversely affect wilderness values. The potential for occurrence of metallic minerals is high in much of the area and moderate in the rest of the area.

Regardless of whether the inholdings are mined or used for other purposes, access by owners could involve the use of vehicles. Owners of inholdings would have such rights as may be necessary to assure them adequate access to their land. Depending on the amount of such vehicle use, it could reduce opportunities for solitude. It might also adversely affect the naturalness of the area by not allowing ways to revegetate.

Closing the ways would improve opportunities for solitude and improve the quality of primitive recreation by reducing the use of motor vehicles. With the continued use of the dead-end roads, such disturbance would not be eliminated.

Possible surface disturbing activities such as mineral development would also be nearly eliminated. Mineral development on existing claims could continue if claims were determined to have a valid discovery of a valuable mineral at the time the wilderness area was designated. This could have an adverse effect on wilderness values on portions of the High Steens WSA near the southeastern boundary, where mining claims and mines are concentrated. Expanded mineral development would adversely affect the areas' naturalness and reduce opportunities for solitude and primitive recreation.

The scenic values of the area would also be maintained by precluding developments within the wilderness.

The **enhanced wilderness alternative** would combine a portion of the High Steens WSA (53,040 acres) with the Little Blitzen Gorge WSA (9,240 acres) and add 70,630 acres to the NWPS, assuming acquisition of 7,460 acres of private and split-estate inholdings and boundary parcels and addition of 890 acres of public land to the areas. The effects of this alternative for the area recommended as suitable for wilderness are similar to the all wilderness alternative, including protection and maintenance of wilderness characteristics, and special features.

In addition, closure of 7 miles of the Steens Loop Road, under this alternative, would enhance the wilderness qualities and opportunities for solitude in areas adjacent to the road. Combining the two areas would create a large, more cohesive wilderness, and it would include all the important integral features of the mountain (the major gorges and the east face) in one wilderness.

In addition to the Steens Loop Road, closure of 3 other dead-end roads (totaling 2 miles) in the High Steens WSA and 19 miles of ways in both the High Steens (15 1/2 miles) and Little Blitzen Gorge (3 1/2 miles) WSAs would enhance naturalness by reducing the opportunity for off-road vehicle use and the resulting surface disturbance. The closed roads and ways would be allowed to revegetate making them less noticeable.

Along the northern boundary of the Little Blitzen Gorge WSA, acquisitions of state, split-estate and private inholdings and boundary parcels and relocating the boundary along an identifiable road would reduce chances that uses incompatible with preservation of wilderness values would inadvertently cross wilderness boundaries. Acquisitions would prevent the possible development of these lands and the need for access to them and would maintain the naturalness of the study area.

In the areas recommended as nonsuitable, primarily in the southeastern and southwestern corners, and in scattered parcels in the northern portion of the High Steens study area, wilderness values and special wilderness features in this part of the study area would be subject to disturbance from other resource uses.

Opportunities for solitude and primitive recreation would be adversely affected in all areas recommended as nonsuitable for wilderness. Vehicle use on existing roads and ways or any new access routes and increased use for possible energy or mineral development would disturb opportunities for solitude and primitive recreation. Surface disturbing activities such as mining or energy development could adversely affect the areas' naturalness and special featues. In the southeastern part of the area, this would include the lower portions of Pike Creek and Little Alvord Creek, and the Whitehorse cutthroat trout which inhabit these stretches of stream. There are no special features in the other areas recommended as nonsuitable for wilderness under this alternative.

The **preferred alternative** would combine a portion of the High Steens WSA (34,220 acres) and a portion of the Little Blitzen Gorge WSA (6,270 acres) and add 44,450 acres to the NWPS, assuming the addition of 720 acres of adjacent

BLM land and the acquisition of 3,240 acres of private, state, and split-estate inholdings and boundary parcels. Closure of approximately 6 miles of the Steens South Loop Road would enhance the wilderness values in areas adjacent to the road. In addition, closure of one dead-end road (totaling 1 mile in length) in the southern end of the High Steens WSA and 11 miles of ways in the High Steens WSA would allow these road surfaces to revegetate and become less noticeable.

Acquisition of private, state, and split-estate inholdings and boundary parcels would improve boundary identification and preclude potential development of these inholdings and adverse effects on the areas' wilderness characteristics and values.

As with the all and enhanced wilderness alternatives, the wilderness values and special features of the area recommended as suitable for wilderness would be preserved and maintained in their present condition, including most of the two WSAs special features. This would include most of the geologic values such as the major gorges and canyons, the outstanding scenic quality, the areas of raptor use, populations of all the plant species of special interest, populations of pikas and northern water shrew, bighorn sheep habitat, and some of the areas of Whitehorse cutthroat trout.

In the portions of the study areas recommended as nonsuitable under this alternative, including the southeastern, southwestern and northwestern corners as well as areas on the eastern, northern and western sides, wilderness values and special wilderness features would be subject to disturbance. The naturalness of the area recommended nonsuitable could be adversely affected by potential geothermal and other mineral development. The entire area has potential for minerals and the eastern edge of the area has a high potential for geothermal resources.

Scenic values, including some of the areas identified as having outstanding scenic quality, could be adversely affected by any development in the area recommended as nonsuitable on the eastern side of the Steens. Any development in this area would be easily visible from the summit of the Steens and other places on the east face of the Steens. Due to the ease of viewing this area from within the wilderness area, developments here could adversely affect the scenic quality of the area recommended as suitable for wilderness.

Opportunities for solitude within the areas not designated as wilderness would be adversely affected by any new developments. This would be especially true in areas where new mineral development could result in increased human activity and the need for increased access to development sites. This could also affect the opportunities for solitude within the area recommended as wilderness.

Adverse effects on primitive recreational opportunities would primarily be a result of increased disturbance from potential mineral development. Mineral development on the eastern side could have an extremely adverse effect on the quality of primitive recreation occurring in this rugged and attractive area. Increased access as a result of development activities could also adversely affect the primitive recreation use of the areas recommended as suitable.

The special wilderness features which occur outside the areas recommended for wilderness under this alternative would be subject to disturbance from other activities or resource uses. Primarily affected would be the crucial deer winter range on the eastern side, and some of the Whitehorse cutthroat trout habitat. The area recommended nonsuitable includes the lower stretches of Little McCoy, Mosquito, Willow, Cottonwood, Big Alvord, Little Alvord and Pike Creeks. Most of these stretches of streams are habitat for the Whitehorse cutthroat trout.

The **partial alternative** would add 44,450 acres to the NWPS, assuming the addition of 720 acres of adjacent BLM land and the acquisition of 3,240 acres of private, state, and split-estate inholdings and boundary parcels. This would include 34,220 acres of the High Steens WSA and 6,270 acres of the Little Blitzen Gorge WSA, managed as two separate wilderness areas.

The effects on the area recommended as suitable under this alternative are almost the same as the preferred alternative, except for effects of leaving the Steens Loop Road open.

Continued vehicle use of the road in the area between the Little Blitzen Gorge and Big Indian Creek canyons would adversely affect primitive recreation in this part of the mountain and lessen opportunities for solitude.

Effects on natural values in the areas recommended as nonsuitable under this alternative would be the same as under the preferred alternative.

Under the **no wilderness/no action alternative**, wilderness values and special features of both WSAs would be subject to disturbance from developments, including the possible development of energy or mineral resources. The effects on specific wilderness values would be similar to those for the nonsuitable portions under the preferred alternative.

However, under this alternative, all of the study areas would be open to potential mineral development, and all of both areas have been identified as having moderate to high potential for mineral occurrence. Development of mineral resources within the central portions of the WSAs could have adverse effects beyond those identified under the preferred alternative. This would be especially true if development were to occur within any of the main gorges, on the Steens ridgeline or on the east-facing escarpment. These parts of the WSAs are highly visible from throughout the area. Any development within this part of the WSAs would have an extremely adverse effect on scenic values, including the outstanding scenic quality identified as a special feature.

Naturalness, opportunities for solitude, and the quality of primitive recreation could all be adversely affected by disturbances from mineral development. Some of the area's important special features such as bighorn sheep habitat, raptor use areas, and scenic values could be adversely affected. Although the five RNA's and the ACEC would remain in effect and would emphasize the protection of some plant and animal species and scenic values, these areas would not be withdrawn from mineral use, so they would still be subject to surface disturbing activities.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development. Table 7 shows the acreage to be withdrawn under each alternative, including acreages of moderate or high mineral potential.

Effects on Vegetation

Areas designated wilderness would not be subject to most surface disturbing activities. Vegetation dependent upon the existing undeveloped environment would thus be maintained.

The fence at Little Blitzen Gorge to protect the Little Blitzen Gorge RNA would protect plants in areas of the upper Steens by preventing livestock grazing in the alpine communities. This and the proposed wildlife fence at McCoy Creek to prevent livestock from grazing the alpine areas of the Steens might or might not be allowed under the **all and enhanced wilderness alternatives** depending on a site-specific analysis of whether they would conform with Wilderness Management policy. The latter fence could also benefit plants of special interest by eliminating livestock grazing in this area where there is a high concentration of special interest plants.

Under the **preferred, partial and no wilderness/no action alternatives**, the proposed wildlife fences would be built resulting in beneficial impacts to vegetation, including plants of special interest, by eliminating grazing in these areas. It would also improve opportunities for botanical studies under more natural conditions.

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness.

Under the **all and enhanced wilderness alternatives**, the proposed 2 miles of fence to control livestock use and improve wildlife habitat, might be appropriate because it would correct the adverse effects of man's influence. A site-specific assessment would be prepared to determine if it conformed with Wilderness Management Policy. If this fence were not built, the opportunity to prevent livestock use of the higher Steens and improve the area for wildlife would be foregone.

The proposed spring development for livestock use may also benefit wildlife by protecting the spring from livestock grazing. This would possibly increase wildlife such as deer and upland game birds and fish slightly. This project might or might not be allowed under the all wilderness alternative, depending on a site-specific analysis of whether it conforms with Wilderness Management Policy.

The spring would be developed under the enhanced wilderness alternative, and the fence and spring developments would be built under the **preferred, partial, and no wilderness/no action alternatives** resulting in some improvement to wildlife habitat and possible slight increases in wildlife populations.

The proposed stream channel project in

Table 7. Effects of Alternatives on Energy and Mineral Development in High Steens WSA (OR-2-85F) and Little Blitzen Gorge WSA (OR-2-86F)

	All Wilderness		Enhanced Wilderness (portion of one WSA, all of other WSA combined)	Acres Withdrawn Preferred Alternative (Portions of both WSAs combined)	Partial Alternative		No Wilderness/No Action
	High Steens	Little Blitzen			High Steens	Little Blitzen	(Both WSAs)
Total acres	65,420	9,240	63,170[1]	41,210[2]	34,940[3]	6,270[4]	0
Metals rated high	65,420	7,060	60,990	39,830	34,940	4,890	0
Metals rated moderate	0	2,180	2,180	1,380	0	1,380	0
Geothermal rated high	6,106	0	1,516	0	0	0	0
Bentonite/Zeolite rated moderate	8,257	0	6,470	3,240	3,240	0	0

[1] Includes 890 acres of public land outside the WSAs. Development also precluded on an additional 7,460 acres if private, state, and split-estate land are acquired as proposed under this alternative.

[2] Includes 720 acres of public land outside the WSAs. Development also precluded on an additional 3,240 acres if private, state, and split-estate land are acquired as proposed under this alternative.

[3] Includes 720 acres of public land outside the WSA. Development precluded on an additional 3,020 acres if private, state, and split-estate lands are acquired as proposed under this alternative.

[4] Development precluded on an additional 220 acres if private and split-estate lands are acquired as proposed under this alternative.

Cottonwood Creek might or might not be allowed under the all wilderness, enhanced wilderness, preferred, and partial alternatives, depending on a site-specific assessment of whether it conforms with Wilderness Management Policy. If the project were not allowed, the opportunity to improve and expand habitat for the Whitehorse cutthroat trout would be foregone. The project would be allowed under the no wilderness/no action alternative. The stocking (or restocking) of the Whitehorse cutthroat trout into Big Alvord and Willow Creeks would be permitted under all of the alternatives.

Effects on Livestock Grazing

Under the **all wilderness alternative**, the spring development proposed for the High Steens WSA in the Alvord Allotment might or might not be allowed depending on a site-specific assessment of whether it conforms with Wilderness Management Policy. If the development could not be constructed, the opportunity to make available additional forage for livestock use and protect the spring would be foregone, along with possible increases of licensed livestock uses of up to 208 AUMs.

Under the **enhanced wilderness, preferred, partial and no wilderness/no action alternatives** the proposed spring development would be constructed, increasing the available livestock forage and protecting the spring.

Under these alternatives the forage produced from the proposed projects (up to 208 AUMs) may be licensed if it is sustainable and all forage needs in the allotment have been considered.

The proposed spring development has a benefit/cost ratio greater than 1:1.

Under the all wilderness alternative, closure of the ways in both WSAs would inconvenience the grazing operators in the extreme northern and southern portions of the High Steens WSA, where ways are used often to distribute salt and monitor livestock and range improvements.

Under the enhanced wilderness alternative, closure of the Steens Loop Road, along with the ways in the northern part of the High Steens WSA, would be very inconvenient to the grazing operators in the northern portion of the study area.

The preferred alternative would only affect the livestock operators who require access along the southern portion of the Loop road. Closure of the Loop road under the preferred alternative would have a moderately inconvenient affect on these operators.

Under the partial and no wilderness/no action alternatives, the Loop road would remain open, no significant ways would be closed, and use of vehicles by the grazing operators would not be affected.

Existing livestock use in the study areas would not change under any of the alternatives.

Effects on Recreation

The quality of and opportunities for primitive recreation in the High Steens and Little Blitzen Gorge WSAs would be maintained at their present level or improved under the **all wilderness alternative**. Improvements in the quality of primitive recreation would be a result of eliminating vehicle use on ways throughout the High Steens WSA. The ways located in the Little Blitzen WSA along with some ways in the High Steens WSA are already closed under the Steens Mountain Recreation Plan.

The all wilderness alternative would generally result in a reduction of vehicle-oriented recreation associated with hunting. Some of the reduction in visitor days from vehicle-oriented hunting would be offset by increased use from hunters who do not use vehicles as a means of transportation within their hunting area.

The loss in visitor days associated with vehicle-oriented hunting is expected to be slight. Wilderness designation would accelerate the currently increasing primitive recreation use. This additional increase would more than offset any losses to vehicle-oriented recreation which may occur, resulting in a substantial increase in overall recreational use.

Combining the two WSAs under the **enhanced wilderness alternative** would improve the quality of primitive recreation activities. Closure of approximately 7 miles of the Steens Mountain South Loop could have an adverse impact on recreational use in some areas of Steens Mountain by not allowing the public to drive the entire Steens Loop Road, which, with approximately 20,000 visitor days per year, is the most popular recreational activity currently occurring on the mountain. It is expected that most of the use would be shifted to areas which remain accessible by vehicle and the overall decrease within the WSAs would be slight.

There may be some reduction in vehicle-oriented recreation associated with hunting due to the closing of 19 miles of ways. However, the loss is expected to be slight. Primitive recreation use, although currently increasing, is expected to accelerate under this alternative, so the overall recreational use on the portions of the Steens Mountain within the two WSAs is expected to increase.

Under the **preferred alternative**, opportunities for primitive recreation would be maintained or improved in the area recommended suitable for wilderness. This alternative combines the two WSAs and would confine opportunities for primitive recreation to a somewhat smaller area than under the all and enhanced wilderness alternatives. However, the area recommended suitable includes most of the important areas for primitive recreation.

The effects of closing 6 miles of the Steens Loop Road are the same as the enhanced wilderness alternative. Closure of 11 miles of way would have only minimal adverse impacts on vehicle-oriented recreation. A substantial amount of primitive recreation use occurs within the WSAs and it is expected that this use would accelerate under this alternative. This should more than offset any reduction of vehicle-oriented recreation, resulting in an increase in overall recreation use.

Under the **partial alternative**, opportunities for and the quality of primitive recreation would be maintained or improved for the area recommended as suitable for wilderness. Since the entire Steens Loop Road would remain open, there would be no effects to vehicle-oriented recreation associated with sightseeing along the road. Quality of primitive recreation may be adversely affected within the WSAs along the Steens Loop due to motor vehicle use.

Other impacts of the partial alternative would be the same as the preferred alternative. Keeping the Steens Loop Road open would maintain vehicle-oriented recreation in these areas. Primitive recreation use is expected to accelerate, so overall recreational use of the area would increase.

Under the **no wilderness/no action alternative**, vehicle access within the Little Blitzen Gorge WSA would continue to be limited, so primitive recreation would remain dominant within much of the area. These activities would be subject to disturbance in areas adjacent to the Loop road. In the High Steens WSA, primitive recreation activities are subordinate to vehicle-oriented recreation, particularly that associated with the Steens Loop. Primitive recreation activities would be disturbed by this existing use and by vehicle use on other roads and ways throughout the WSA.

The proposed livestock and wildlife projects, if constructed, would have minimal effects on primitive recreation under any of the alternatives. Due to the type of projects and the nature of the terrain in which they would be developed, there would be slight increases in wildlife populations and correspondingly slight increases in recreation use. Vehicle-oriented recreation could benefit from any additional access provided by development. Overall recreation use would not change.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 8a-c and 9a-c. Tables 8a-c shows the effects on economic value and table 9a-c, the effects on local personal income.

The columns for the wilderness alternatives show the effects as a range of values dependent upon whether structural improvements, and/or grazing operator access were allowed.

Currently, vehicles are used for livestock management in the study area. The all wilderness, enhanced wilderness, preferred, and partial alternatives would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the High Steens WSA would be an increase in cost of about $452 per year, and for Little Blitzen Gorge WSA, an increase of about $45 per year.

Table 8a. Effects of Alternatives on Annual Economic Value, High Steens (OR-2-85F) and Little Blitzen Gorge (OR-2-86F) WSAs (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	Preferred, Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Grazing:					
Investment [1]	AUM	0 to +208	+208	+208	+208
Big Game Hunting [2]	RVD	0 to +125	+125	+125	+125
Upland Game Hunting [2]	RVD	0 to +5	+5	+5	+5
Fishing [2]	RVD	0 to +2	+2	+2	+2
Oil and Gas Leases	Acres	-66,016	-48,960	-36,975	0
Geothermal Leases	Acres	-4,540	0	0	0
VALUE OF PLANNED INVESTMENTS [3]					
Grazing	$	0 to +1,568	+1,568	+1,568	+1,568
Big game hunting	$	0 to +2,836	+2,836	+2,836	+2,836
Upland game hunting	$	0 to +157	+157	+157	+157
Fishing	$	0 to +40	+40	+40	+40
Total	$	0 to +4,601	+4,601	+4,601	+4,601
Investments [4]	$	0 to -2,055	-282 to -2,055	-1,249 to -2,055	-2,055
Net Economic Value	$	0 to +2,546	+2,546 to +4,319	+2,546 to +3,352	+2,546
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS					
Reduced access [5]	$	-497	-497	-497	0
Oil and Gas Leases	$	-66,016	-48,960	-36,975	0
Geothermal Leases	$	-7,195	0	0	0
Total	$	-73,708	-49,457	-37,472	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS					
All categories	$	-73,708 to -71,162	-46,911 to -45,138	-34,926 to -34,120	+2,546

[1] Expected future increases due to range improvement investments.
[2] Expected future increases due to proposed livestock projects.
[3] Structural projects involving up to $25,500, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[4] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.
[5] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 8b. Effects of Alternatives on Annual Economic Value, High Steens WSA (OR-2-85F) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	Preferred, Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Grazing:					
Investment [1]	AUM	0 to +208	+208	+208	+208
Big Game Hunting [2]	RVD	0 to +125	+125	+125	+125
Upland Game Hunting [2]	RVD	0 to +5	+5	+5	+5
Fishing [2]	RVD	0 to +2	+2	+2	+2
Oil and Gas Leases	Acres	-60,793	-43,737	-33,420	0
Geothermal Leases	Acres	-4,540	0	0	0
VALUE OF PLANNED INVESTMENTS [3]					
Grazing	$	0 to +1,568	+1,568	+1,568	+1,568
Big game hunting	$	0 to +2,836	+2,836	+2,836	+2,836
Upland game hunting	$	0 to +157	+157	+157	+157
Fishing	$	0 to +40	+40	+40	+40
Total	$	0 to +4,601	+4,601	+4,601	+4,601
Investments [4]	$	0 to -2,055	-282 to -2,055	-1,249 to -2,055	-2,055
Net Economic Value	$	0 to +2,546	+2,546 to +4,319	+2,546 to +3,352	+2,546
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS					
Reduced access [5]	$	-452	-452	-452	0
Oil and Gas Leases	$	-60,793	-43,737	-33,420	0
Geothermal Leases	$	-7,195	0	0	0
Total	$	-68,440	-44,189	-33,872	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS					
All categories	$	-68,440 to -65,894	-41,643 to -39,870	-31,326 to -30,520	+2,546

[1] Expected future increases due to range improvement investments (spring).

[2] Expected future increases due to proposed livestock projects (spring).

[3] Structural projects involving up to $25,500, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[5] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 8c. Effects of Alternatives on Annual Economic Value, Little Blitzen Gorge WSA (OR-2-86F) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhance Wilderness	Preferred, Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Oil and Gas Leases	Acres	-5,223	-5,223	-3,555	0
VALUE OF EXPECTED CHANGES IN OUTPUTS					
Reduced access [1]	$	-45	-45	-45	0
Oil and Gas Leases	$	-5,223	-5,223	-3,555	0
Total	$	-5,268	-5,268	-3,600	0

[1] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 9a. Effects of Alternatives on Local Personal Income, High Steens (OR-2-85F) and Little Blitzen Gorge (OR-2-86F) WSAs (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	Preferred, Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Grazing:					
Investment [1]	AUM	0 to +208	+208	+208	+208
Big Game Hunting [2]	RVD	0 to +125	+125	+125	+125
Upland Game Hunting [2]	RVD	0 to +5	+5	+5	+5
Fishing [2]	RVD	0 to +2	+2	+2	+2
Oil and Gas Leases	Acres	-66,016	-48,960	-36,975	0
Geothermal Leases	Acres	-4,540	0	0	0
INCOME FROM PROPOSED INVESTMENTS [3]					
Grazing	$	0 to +1,735	+1,735	+1,735	+1,568
Big game hunting	$	0 to +1,241	+1,241	+1,241	+2,836
Upland game hunting	$	0 to +77	+77	+77	+157
Fishing	$	0 to +23	+23	+23	+40
Construction Activity [4]	$	0 to +3,419	+470 to +3,419	+2,083 to +3,419	+3,419
Total [5]	$	0 to +3,076	+3,076	+3,076	+3,076
INCOME FROM OTHER EXPECTED OUTPUT CHANGES					
Oil and Gas Leases	$	-19,881	-14,744	-11,135	0
Geothermal Leases	$	-2,167	0	0	0
Total	$	-22,048	-14,744	-11,135	0
INCOME FROM ALL OUTPUT CHANGES					
All categories	$	-22,048 to -18,972	-11,688	-8,059	+3,076

[1] Expected future increases due to range improvement investments.

[2] Expected future increases due to proposed livestock projects.

[3] Structural projects involving up to $25,500, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[5] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to a 5-year period. See footnote 4.

Table 9b. Effects of Alternatives on Local Personal Income, High Steens WSA (OR-2-85F) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	Preferred, Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Grazing:					
Investment [1]	AUM	0 to +208	+208	+208	+208
Big Game Hunting [2]	RVD	0 to +125	+125	+125	+125
Upland Game Hunting [2]	RVD	0 to +5	+5	+5	+5
Fishing [2]	RVD	0 to +2	+2	+2	+2
Oil and Gas Leases	Acres	-60,793	-43,737	-33,420	0
Geothermal Leases	Acres	-4,540	0	0	0
INCOME FROM PROPOSED INVESTMENTS [3]					
Grazing	$	0 to +1,735	+1,735	+1,735	+1,735
Big game hunting	$	0 to +1,241	+1,241	+1,241	+1,241
Upland game hunting	$	0 to +77	+77	+77	+77
Fishing	$	0 to +23	+23	+23	+23
Construction Activity [4]	$	0 to +3,419	+470 to +3,419	+2,083 to +3,419	+3,419
Total [5]	$	0 to +3,076	+3,076	+3,076	+3,076
INCOME FROM OTHER EXPECTED OUTPUT CHANGES					
Oil and Gas Leases	$	-18,308	-13,171	-10,064	0
Geothermal Leases	$	-2,167	0	0	0
Total	$	-20,475	-13,171	-10,064	0
INCOME FROM ALL OUTPUT CHANGES					
All categories	$	-20,475 to -17,399	-10,095	-6,988	+3,076

[1] Expected future increases due to range improvement investments (spring).

[2] Expected future increases due to proposed livestock projects (spring).

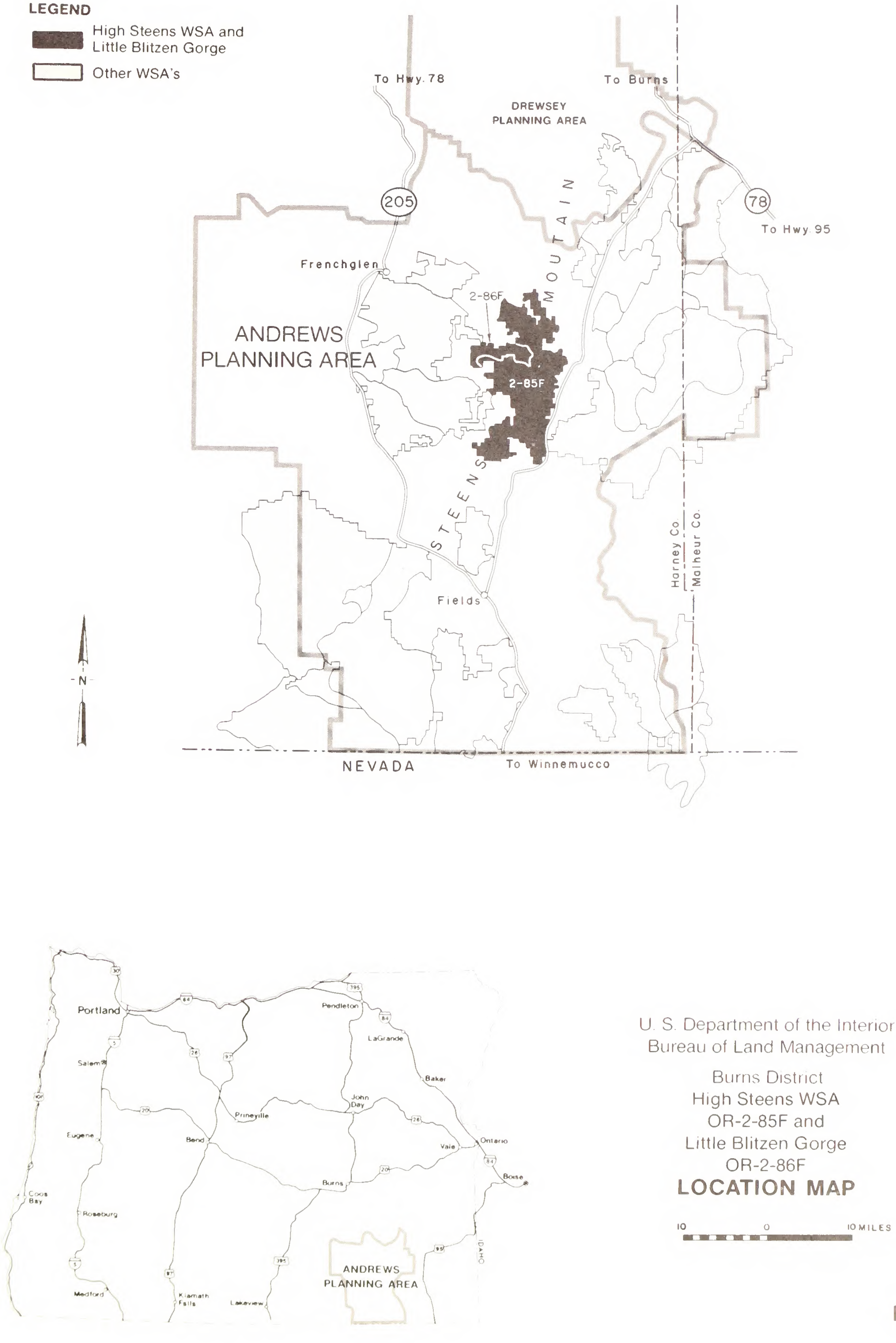
[3] Structural projects involving up to $25,500, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[5] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to a 5-year period. See footnote 4.

Table 9c. Effects of Alternatives on Local Personal Income, Little Blitzen Gorge WSA (OR-2-86F) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhance Wilderness	Preferred, Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Oil and Gas Leases	Acres	-5,223	-5,223	-3,555	0
VALUE OF EXPECTED CHANGES IN OUTPUTS					
Oil and Gas Leases	$	-1,573	-1,573	-1,071	0



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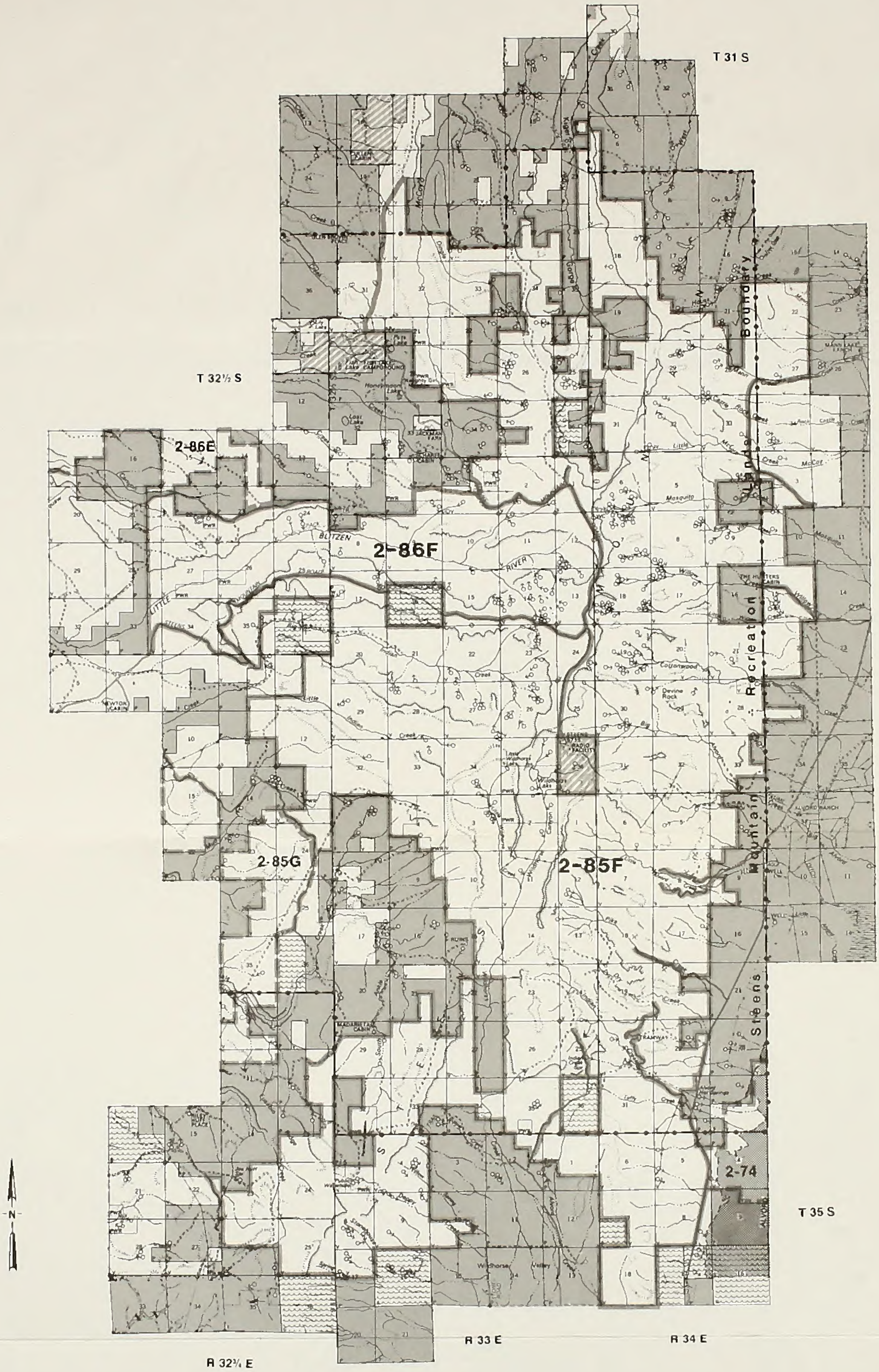
Burns District
High Steens WSA
OR-2-85F and
Little Blitzen Gorge
OR-2-86F

LOCATION MAP

MAP 1



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High Steens WSA
OR-2-85F and
Little Blitzen Gorge
OR-2-86F

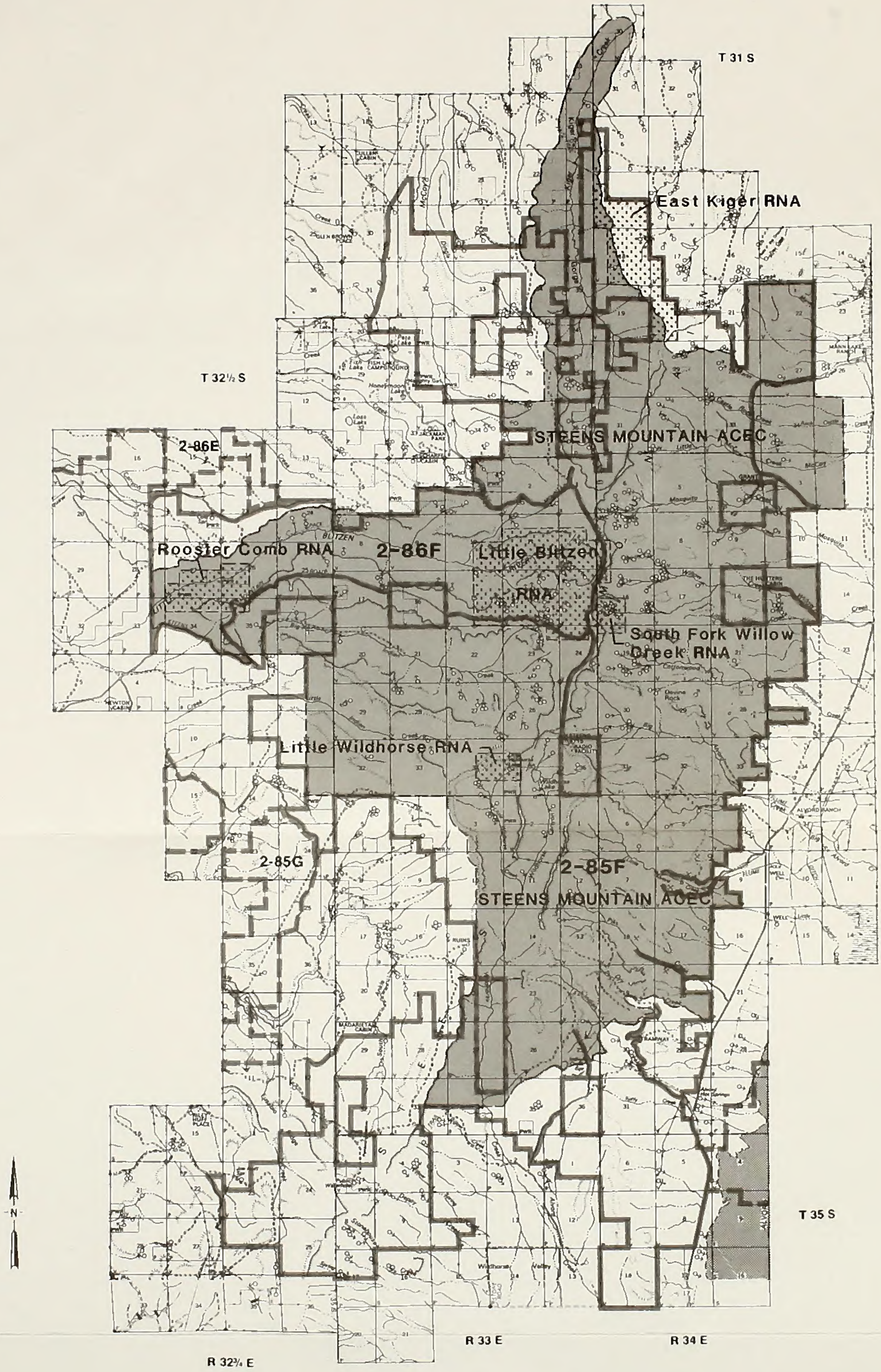
LAND OWNERSHIP

1 0 1 2 MILES

MAP 2

LEGEND

- ▬ Wilderness Study Area Boundary
- ▬ ▬ Boundary of Adjacent Wilderness Study Areas
- ☐ Bureau of Land Management
- ▨ State
- ■ Private
- ▤ BLM Surface-State or Private Subsurface (Split Estate)



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Bureau of Land Management

Burns District

High Steens WSA
OR-2-85F and
Little Blitzen Gorge
OR-2-86F

AREAS OF CRITICAL ENVIRONMENTAL CONCERN & NATURAL RESEARCH AREAS

1 0 1 2 MILES

MAP 3

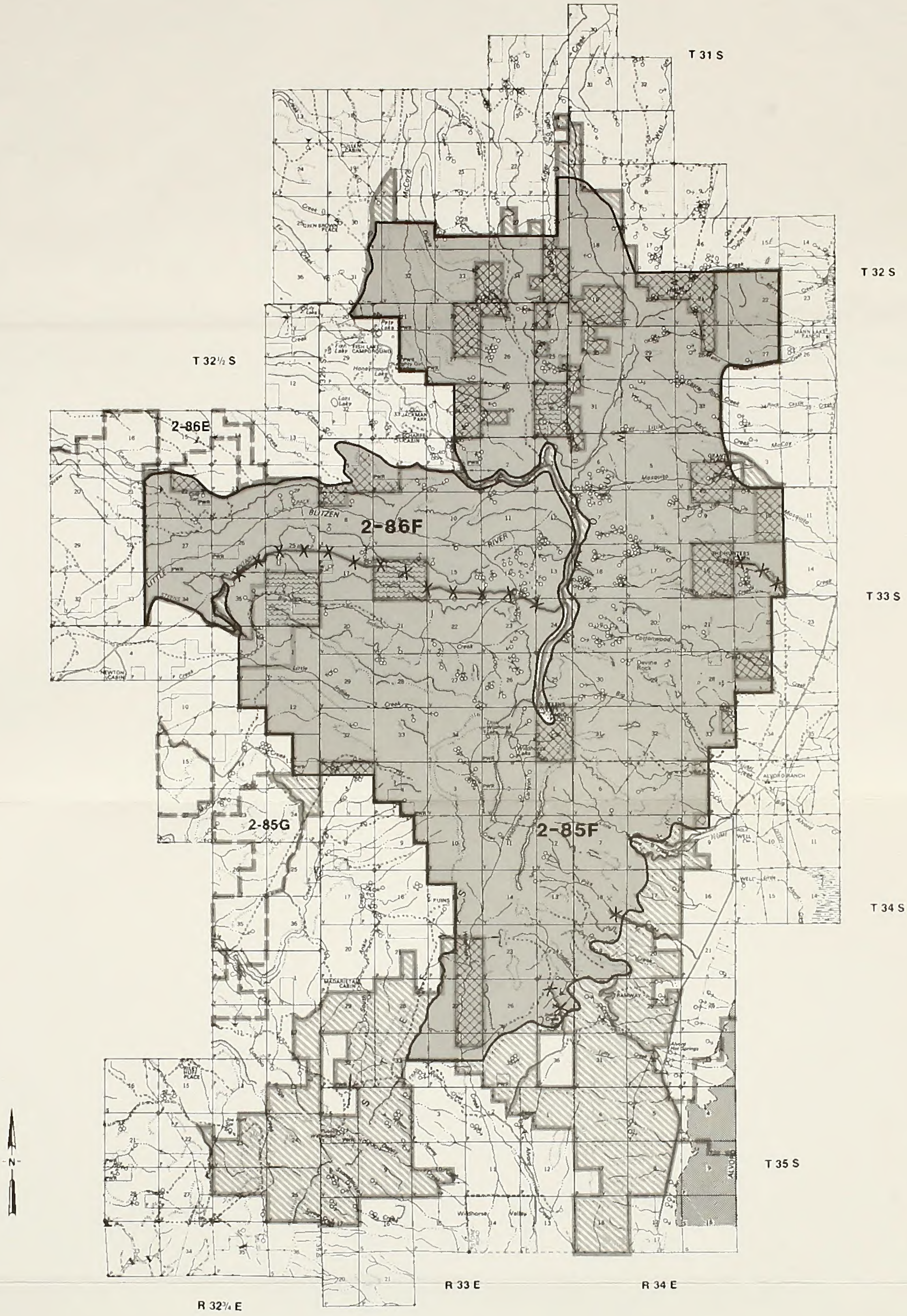
LEGEND

— Wilderness Study Area Boundary

- - Boundary of Adjacent Wilderness Study Areas

▨ Areas of Critical Environmental Concern Boundary (ACEC)

░ Research Natural Areas Boundary (RNA)



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High Steens WSA
OR-2-85F and
Little Blitzen Gorge
OR-2-86F

ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 4

LEGEND

— Wilderness Study Area Boundary

– – Boundary of Adjacent Wilderness Study Areas

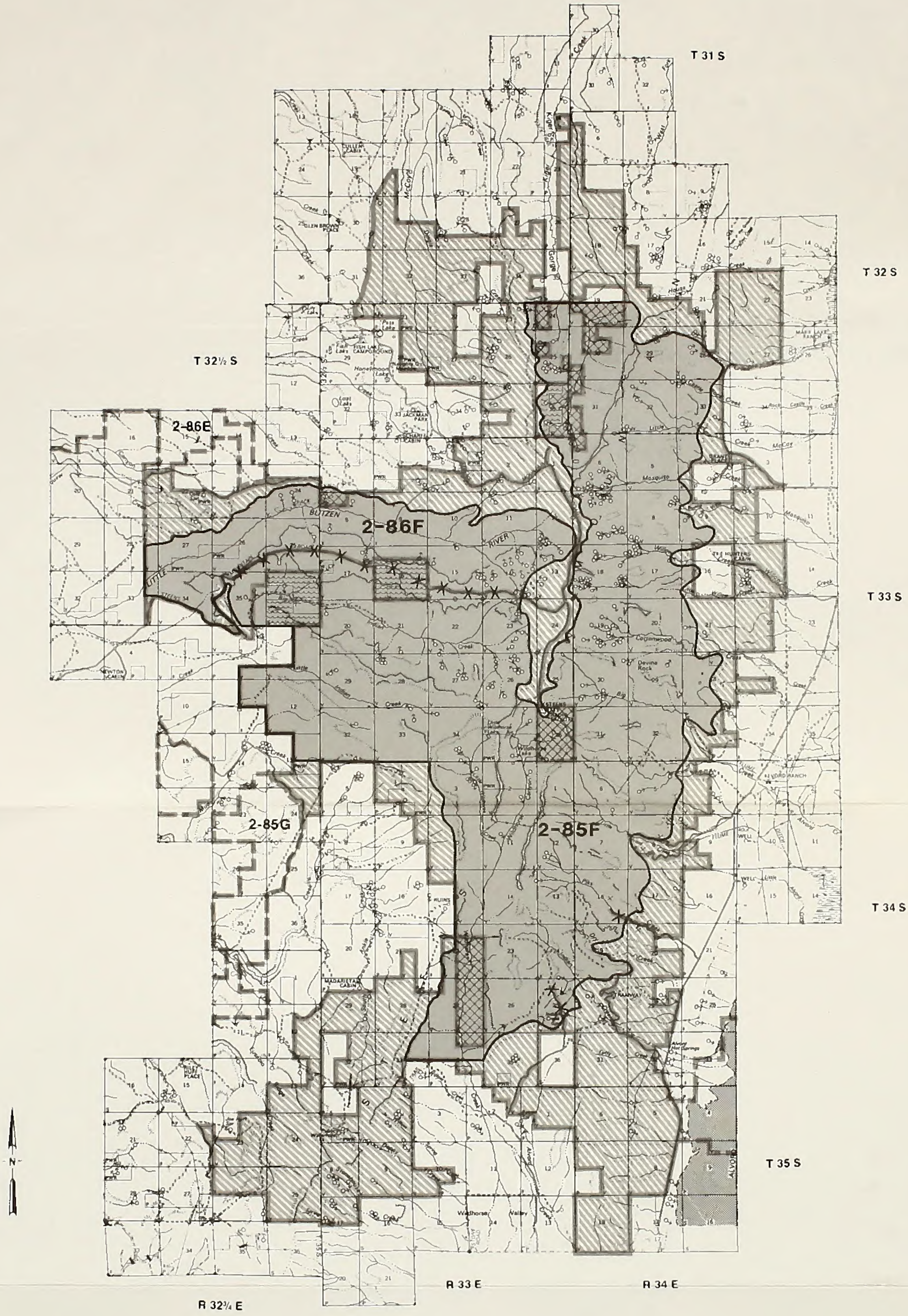
▢ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

▩ Non-Federal Land within Recommended Wilderness

▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

✕—✕ Recommended Road Closure



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Burns District

High Steens WSA
OR-2-85F and
Little Blitzen Gorge
OR-2-86F

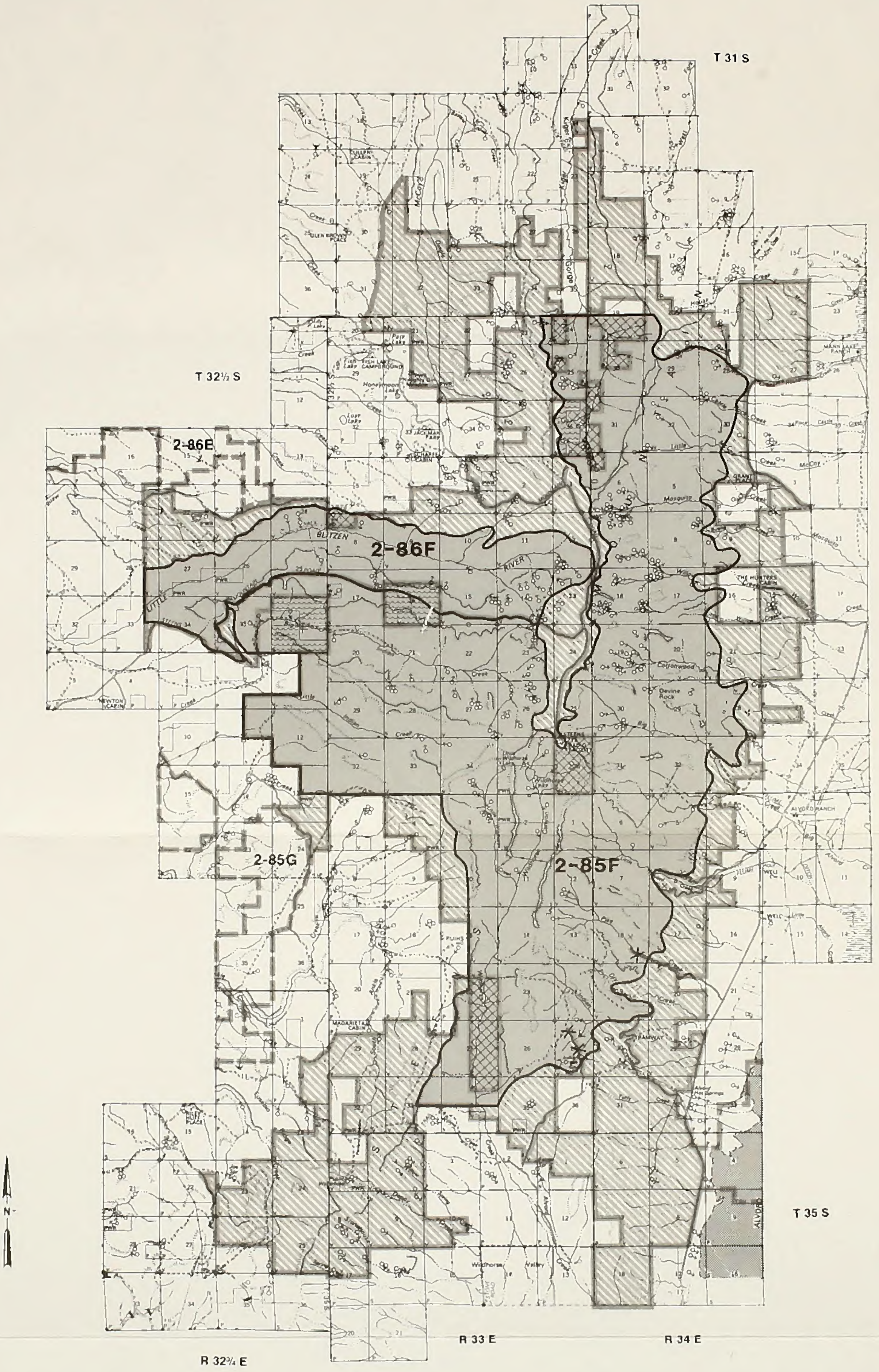
PREFERRED ALTERNATIVE

1 0 1 2 MILES

LEGEND

- Wilderness Study Area Boundary
- Boundary of Adjacent Wilderness Study Areas
- ▢ Recommended Suitable for Wilderness
- ▨ Recommended Non-suitable for Wilderness
- ▩ Non-Federal Land within Recommended Wilderness
- ▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness
- ✕—✕ Recommended Road Closure

MAP 5



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High Steens WSA
OR-2-85F and
Little Blitzen Gorge
OR-2-86F

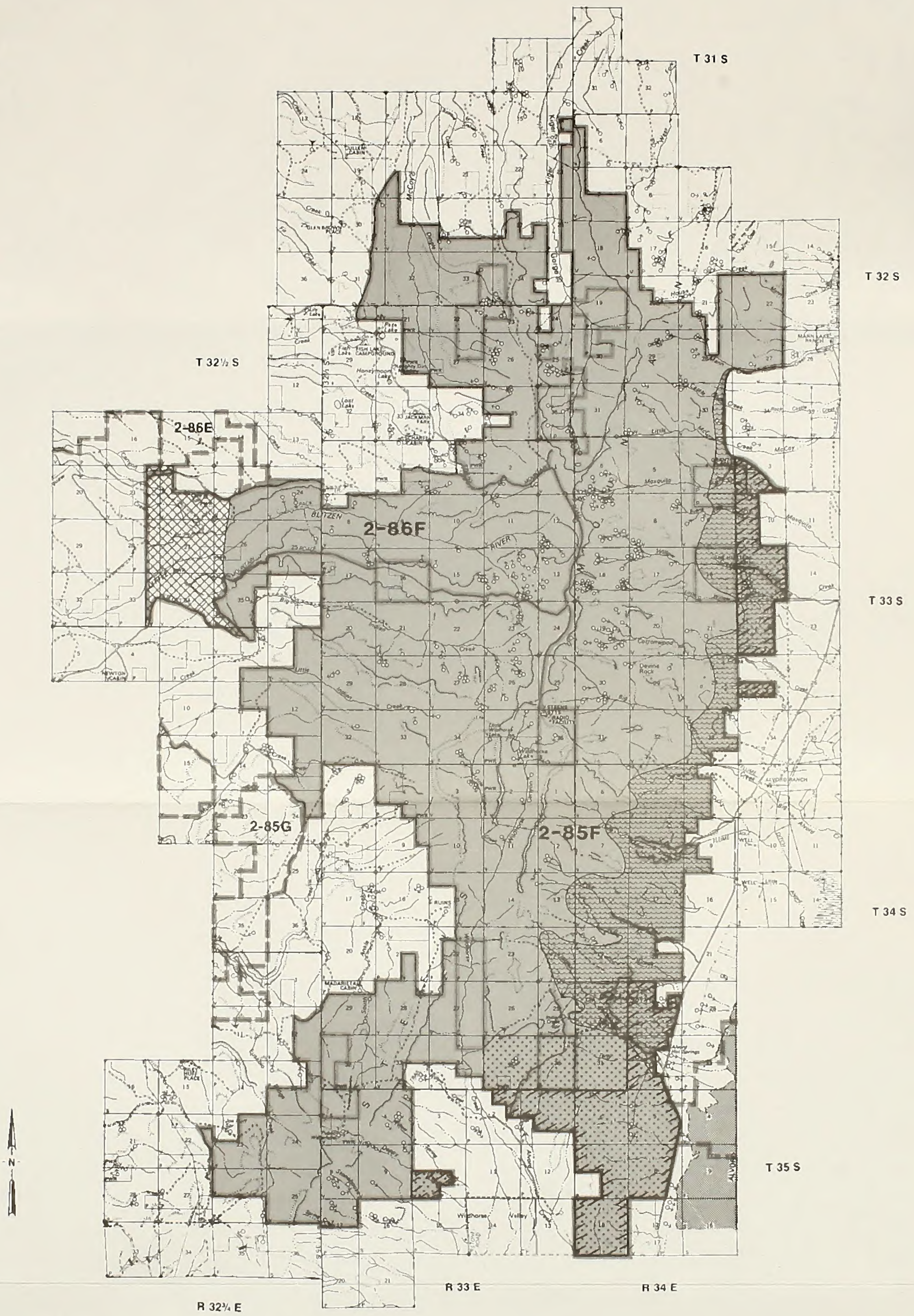
PARTIAL ALTERNATIVE

1 0 1 2 MILES

LEGEND

- ▬ Wilderness Study Area Boundary
- ‒ ‒ Boundary of Adjacent Wilderness Study Areas
- ■ Recommended Suitable for Wilderness
- ▨ Recommended Non-suitable for Wilderness
- ▩ Non-Federal Land within Recommended Wilderness
- ▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness
- X—X Recommended Road Closure

MAP 6



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Burns District

High Steens WSA
OR-2-85F and
Little Blitzen Gorge
OR-2-86F

MEDIUM OR HIGH POTENTIAL
MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

▩ **High Potential**
(4D) for Mercury, Copper, Gold, Silver and Molybdenum

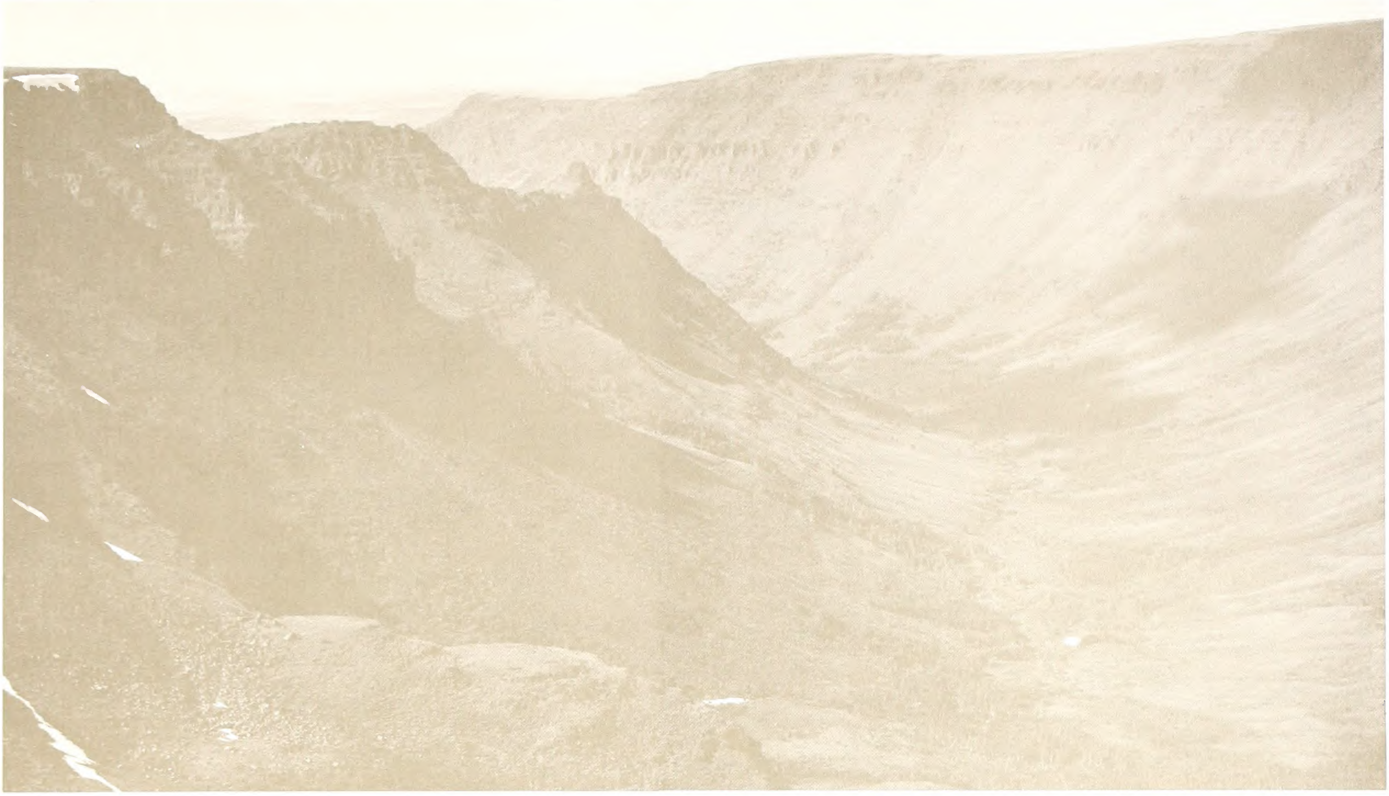
▦ **Medium Potential**
(3B) for Mercury, Copper, Gold, Silver and Molybdenum

▤ **Medium Potential**
(3B) Bentonite and Zeolites

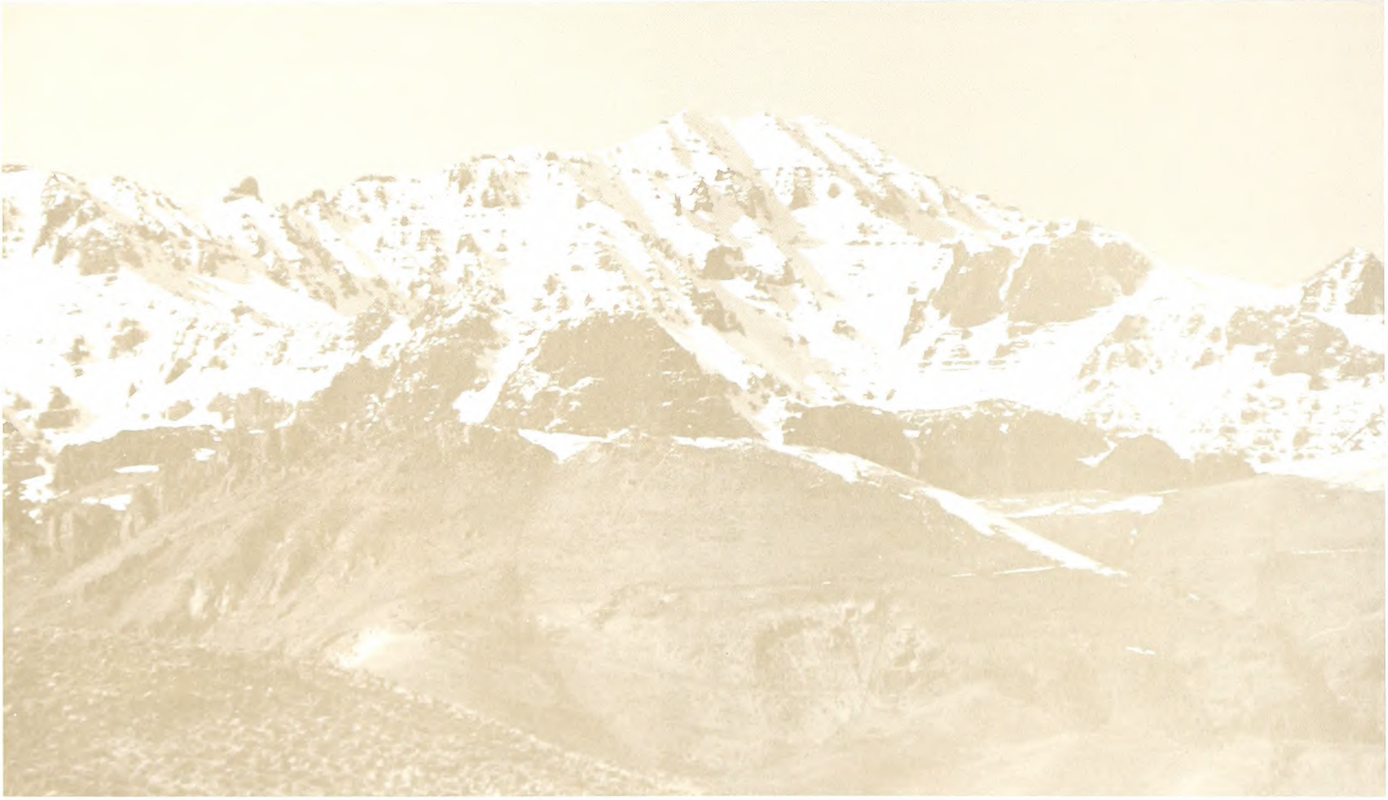
░ **High Potential**
(4D) for Geothermal Resources

▨ **Portion of WSA within known Geothermal Resource Area**

MAP 7



High Steens WSA, OR-2-85F. The overlook at the head of Kiger Gorge looking north. Most of the area seen here is suitable under the enhanced, preferred, and partial alternatives. Kiger Gorge is the largest of the five "U" shaped glaciated gorges in the High Steens WSA. It averages over a mile in width and more than 2000 feet deep. Large portions of the canyon bottom are privately owned. July 1983.



High Steens WSA, OR-2-85F. The southeastern corner of the study area, looking northwest showing some of the lower foothills as well as the high steep east face of the mountain. Most of the lower slopes in the foreground are nonsuitable under the preferred alternative, while the upper elevations are suitable under the enhanced and partial alternatives. April 1984.

High Steens WSA, OR-2-85F. Looking southwest from the western slope of the mountain across the remainder of the Steens fault block. Only the immediate foreground is included within the study area but it is nonsuitable under the preferred and partial alternative and suitable under the enhanced alternative. The prominent features in the background include Home Creek Canyon (just left of center), Dry Creek Canyon (just right of center), and Beaty Butte (the peak on the horizon about 40 miles away). September 1983.

High Steens WSA, OR-2-85F. Looking south from the head of Wildhorse Canyon near the top of the Steens. All of this drainage is suitable under the enhanced, partial and preferred alternatives. Features outside the WSA which can be seen from this point include Alvord Lake (middle ground), the Pueblo Mountains (background center and right) and mountains in Nevada (faintly visible on the horizon). Wildhorse Lake, the larger of the two, like the other features in the canyon, is glacially formed. August 1983.

Little Blitzen Gorge WSA, OR-2-86F. The upper end of the Little Blitzen Gorge looking east. Within the area recommended suitable under the enhanced, partial and preferred alternatives. The Little Blitzen Gorge is one of the glacially carved U-shaped canyons on Steens Mountain. September 1983.

Little Blitzen Gorge, OR-2-86F. The eastern boundary area (the Steens Loop Road) looking west. Within the area recommended suitable under the enhanced alternative. The area to the left of the northern rim of the canyon (the canyon wall on the right) is suitable (the remainder is unsuitable) under the preferred and partial alternatives. Heavy snowpacks remain on the more protected north facing slopes well into the summer. July 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

South Fork of the Donner und Blitzen River Wilderness Study Area (OR-2-85G)

General Description of the Study Area

The South Fork of the Donner und Blitzen River wilderness study area (WSA) is located about 74 miles south of Burns (about 12 miles south of Frenchglen) in Harney County (see map 1). The study area lies along the south loop of the Steens Mountain Loop Road about 7 miles east of State Highway 205.

The area is basically rectangular with the western end being somewhat narrower than the remainder. A roughly "L" shaped portion on the eastern side is almost entirely separated from the main body of the area by a large section of private land.

The study area contains approximately 35,850 acres of public land (see map 2). In addition, four inholdings totaling 2,600 acres are scattered within the boundary of the WSA. Two of these parcels are separate 640-acre sections of private land while the other parcels are two 640 acre sections of split-estate land (federally managed surface, state or privately owned subsurface mineral rights) and a 40-acre section of private land adjacent to one of the split-estate sections.

The majority of the study area is bounded by BLM roads with public land on the other side of the road. The northern boundary of the area is formed entirely by the southern extension of the Steens Mountain Loop Road. The western and southwestern boundaries are formed by BLM roads and two parcels of private land. The eastern boundary is formed by a combination of BLM roads and split-estate and private land with the majority of the boundary being private land.

The South Fork of the Donner und Blitzen River WSA is located within the central portion of the physiographic feature known as the Steens Mountain Fault Block. Most of the terrain is flat to gently rolling. The major feature of the WSA is the river corridor. Located in the eastern portion of the study area, the river flows from south to north. Of the 8 1/2 miles of river associated with this study area, 6 miles flow across public land, and approximately 2 miles flow through private land just outside the boundary while 1/2 mile crosses a private inholding. Small segments of three other perennial streams (Indian, Deep and Ankle Creeks) also pass through the study area and drain into the South Fork.

This eastern portion of the study area contains the greatest amount of topographic diversity as the river and creeks all flow through canyons which range from 100 to 200 feet in depth. Overall, the elevation of the study area averages about 5,800 feet with the extremes ranging from 5,100 feet in the river bottom near the northern boundary to 6,500 feet in the southeastern corner of the "L" shaped extension.

Juniper and low sagebrush are the dominant vegetation in the study area. Most of the junipers are located within the eastern two thirds of the WSA. Low sagebrush occurs throughout most of the study area, but is most common in the western portions. A variety of grasses are also found within the area. The river and the larger creeks contain riparian vegetation, and a grove of aspen is located within the Deep Creek drainage.

Interrelationships

The study area is adjacent to three other WSAs. On the north, the South Loop of the Steens Mountain Road separates the South Fork study area from the Blitzen River WSA (OR-2-86E). On the west, another BLM road divides the study area from the Home Creek study area (OR-2-85H), and to the east a BLM road separates the "L" shaped extension of the South Fork WSA from the High Steens WSA (OR-2-85F).

Most of the northern and northeastern portions of the study area fall within the BLM-managed Steens Mountain Recreation Lands, a large amount of land on Steens Mountain designated by BLM in 1971 in cooperation with local groups and other government agencies as well as private landowners. Its purpose is to maintain a multiple-use-management concept on the mountain while protecting the area's natural condition.

The Oregon Department of Fish and Wildlife (ODFW) conducts an aerial survey (count) of a summering antelope herd in the WSA.

Most of the study area is in the South Steens wild horse herd management area (HMA). HMA management will not be significantly affected by any of the alternatives.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- potential for increased recreation use because of wilderness designation and its effects on wilderness values and other features of the area (BLM's wilderness management policy states that recreation use would be managed to protect the area's wilderness values),

- potential energy and mineral development,

- effect of wilderness designation on the existing designation of a portion of the WSA as part of the Steens Mountain Recreation Lands (the designation would not be affected, but the management plan for the recreation lands would need revision),

- management of wild horses in the area (see Statewide EIS volume), and

- restriction of vehicle access and the impact on fish and wildlife populations in the area, if designated wilderness.

Also raised as issues were: the possibility of combining this WSA with adjacent study areas to form a single, larger wilderness area; and whether the area is manageable as wilderness given its configuration.

Description of the Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- no wilderness/no action (preferred alternative)

The possibility of combining this study area with the three adjacent WSAs is not analyzed in the enhanced wilderness alternative. The roads which divide the South Fork of the Donner und Blitzen River WSA from the Blitzen River WSA to the north and Home Creek WSA to the west are important BLM roads which provide access to private land owners, ranchers, BLM personnel, hunters, general recreationists, and sightseers.

The road which divides the WSA from the High Steens WSA to the east is used for the same purposes but to a lesser extent. In this case, however, the adjacent boundary between the two study areas is less than one mile and is not near the area of high recreation use for either of the WSAs. Also, such a combination would do little to enhance the wilderness values of either study area without the acquisition of extensive private and split-estate land.

Although considered, an alternative recommending only part of the WSA as suitable for wilderness is not developed for this study area. Areas where wilderness management would conflict with other resource uses are not confined to a particular portion of the WSA, and therefore an analysis of an alternative recommending only part of the area as suitable for wilderness is not warranted.

All Wilderness

The all wilderness alternative would recommend all 35,850 acres of public land within the study area as suitable for wilderness (see map 2). For purposes of analysis, it is assumed the split-estate and private inholdings would not be acquired.

Enhanced Wilderness

The enhanced wilderness alternative would also recommend all 35,850 acres of public land in the study area suitable for wilderness (see map 3). In addition, an attempt would be made to acquire a total of 5,700 acres of private and split-estate lands, both within and adjacent to the WSA. This land could be acquired through purchase or exchange with willing landowners. The acquisitions would include the two split-estate inholdings (totaling 1,280 acres), the private inholdings (totaling 1,320 acres) and portions of private land along the boundary (totaling 3,100 acres).

Assuming acquisition of these parcels, total area recommended suitable under this alternative would be 41,550 acres.

With the exception of minor adjustments to reflect the acquisition of private and split-estate lands, there would be no major changes in the boundary of the suitable area under this alternative.

This alternative would give wilderness protection to the lower elevation plateau country associated with Steens Mountain. In addition, a large portion of the upper drainage of the Donner und Blitzen River (the South Fork) and portions of its tributaries would also be within the area recommended suitable. The entire 8 miles of river corridor on the eastern side of the study area would fall under wilderness management and would be available for primitive recreational activities. The acquisitions would also add 1 1/2 miles of Ankle Creek which would add to the recreational opportunities in the eastern side of the WSA.

The acquisition of private land adjacent to the boundary would more solidly block the "L" shaped extension on the east with the main body of the study area. In addition to alleviating a management problem caused by an area almost completely surrounded by private lands, this alternative would include the higher elevation lands which occur along the eastern side of the WSA.

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued vehicle use in the area, subject to seasonal restrictions in those portions of the study area within the Steens Mountain Recreation Lands (generally the northern half of the study area), and no restrictions on vehicle use in the remainder of the study area,

- continued availability for mineral exploration and development, and

- construction of a proposed fence to improve livestock grazing.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The South Fork of the Donner und Blitzen River WSA would be manageable as wilderness under the all wilderness alternative, but such management would be difficult because of the private lands on the east side of the WSA. The private land would cause two problems. First, the wilderness area's boundary would follow legal subdivisions along most of the eastern side, making boundary

Table 1. Summary of Proposed Management Under Each Alternative, South Fork of the Donner und Blitzen River WSA (OR-2-85G)

Proposed Management	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	35,850	35,850	0
Acres Closed to ORVs by Wilderness Designation	35,850	35,850	0
Miles of Ways Closed	27	27	0
Acres of Full Fee Estate Acquired[1]	0	4,420	0
Acres of Split Estate Acquired [1]	0	1,280	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	35,850	35,850	0
Structural Livestock Projects Developed:			
Fences (miles)	0-4	0-4	4

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

identification difficult. This problem is compounded by the presence of the "L" shaped extension which is nearly surrounded by unmarked private land.

The second problem is location of the private land. The area's primary recreational attraction likely would be the river corridor, and to a lesser extent, the larger tributaries which enter from the east. About 2 1/2 miles of the river within this corridor crosses privately owned land (this includes 1 inholding and a portion of private land on the boundary). Management of this part of the area would be difficult if the landowner did not want general recreation use to occur on these parcels.

Even with signing or fencing, recreational use of the river corridor or the "L" shaped extension would be difficult to manage for recreation purposes under the all wilderness alternative.

The enhanced alternative would be manageable as wilderness. There would be no substantial manageability problems because the inholdings and the land between the main body of the WSA and the "L" would be acquired. The perimeter of the area which bounds other private lands could be adequately signed or fenced. Boundary identification and restrictions on the use of adjacent private land could be minimized under this alternative.

Rationale for the Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because of the potential manageability problems associated with the private land on the eastern side of the study. Most of the wilderness values in the WSA are in the eastern portion and the river corridor where the private land is located. The western portion of the study area does not possess a significant number or variety of wilderness values.

Wilderness designation of the WSA would require the acquisition of substantial amounts of private land. These acquisitions would be essential in order to improve the quality of the area's wilderness values and reduce the potential for management problems. Although the area possesses some wilderness values, particularly along the eastern portion, these values do not outweigh the value of leaving the area open to the existing vehicle-oriented uses and management; nor are the wilderness values of such significance as to warrant the necessary acquisitions of private land.

Affected Environment

This section discusses only those activities or resources which influence the character of the study area or that may be affected by the alternatives.

Wilderness Values

Naturalness

The WSA appears to be in a relatively natural condition. The man-made features influence only a very small portion of the WSA and are largely unnoticeable overall.

The WSA contains 28 man-made features: 13 reservoirs, 11 vehicle ways totaling about 27 miles, a corral, 2 fences totaling 2 miles, and an old abandoned habitation. These developments influence about 2 percent of the WSA. (The area of influence is an estimate of the acreage in the WSA from which these man-made features can be seen.)

Eight of the reservoirs are located along the western boundary. The other 5 are scattered through the remainder of the WSA. The reservoir with the greatest influence is Long Reservoir located on the western side of the study area in a

Table 2. Summary of Environmental Consequences of Alternatives, South Fork of the Donner Blitzen River WSA (OR-2-85G)

Resource or Activity	All Wilderness	Enhanced Wilderness	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 35,850 acres to NWPS, including the South Fork of the Blitzen River and its major tributaries of Deep, Ankle and Indian Creeks. Maintains or improves the present level of wilderness characteristics. Closure of 27 miles of ways would improve wilderness values. Preserves 2 plant species of special interest, a sage grouse strutting ground and a wild horse herd. Although significant manageability problems exist due to inholdings and adjoining private land, the area is manageable as wilderness.	Would add 41,550 acres to NWPS, assuming acquisition of 5,700 acres of private and split-estate land. Preserves all of the features identified in the all wilderness alternative. Closure of 27 miles of ways would improve wilderness values. Improves the manageability by acquisition of split-estate and private inholdings and boundary parcels to make the boundaries more readily identifiable and avoid conflicts with private landowners.	Wilderness values and special features would be subject to disturbance from potential developments.
Energy and Mineral Development	Development precluded on 35,850 acres, including 1,997 acres with moderate potential for diatomite.	Same as all wilderness alternative, except development precluded on an additional 5,700 acres if private and split-estate land is acquired.	No impact.
Wildlife	Wildlife habitat preserved. Opportunity to improve wildlife riparian habitat might be foregone, along with slight increases in wildlife and fish population.	Same as all wilderness.	Proposed range improvement would be implemented, improving wildlife habitat, possibly increasing wildlife and fish populations.
Livestock Grazing	If proposed fence is precluded, opportunity for better distribution of livestock and an increase of additional forage within the WSA would be foregone. A possible increase in licensed livestock use of up to 1,950 AUMs would also be foregone. Closure of ways would inconvenience grazing operator.	Same as all wilderness.	All proposed developments would be permitted resulting in better livestock distribution and additional forage in the WSA. Up to 1,950 AUMs of additional licensed livestock forage could be realized in the allotment. No restriction on vehicle use.
Recreation Use	Use of motorized vehicles for recreation would be eliminated. Slight increases in recreation use from proposed livestock fence (if built). Net reduction in overall recreation use.	Same as all wilderness.	Existing vehicle-oriented uses of the area would continue. Primitive recreation would be adversely affected. Slight increases in recreation use from proposed livestock fence. Overall, no significant impact.
Economic Value and Local Income	Decrease in economic value and local personal income by $17,844 and $5,278, respectively, if proposed project is not allowed. Decrease in economic value by $1,468 and increase in local personal income by $12,322 if projects are allowed. The maximum increase in transportation costs to ranchers with grazing permits would be $319.	Decrease in economic value and local personal income by $21,404 and $6,350, respectively, if proposed project is not allowed. Decrease in economic value by $5,028 and increase in local personal income by $11,250 if projects are allowed. The maximum increase in transportation costs to ranchers with grazing permits would be $319.	Increase in economic value and local personal income by $16,376 and $17,600, respectively, from construction of proposed projects.

broad, shallow drainage. The other reservoirs are screened by either topography or vegetation.

The vehicle ways in the area are also generally screened by topography and vegetation. The ways that run through small valleys are generally screened by juniper trees, while others cross through relatively flat terrain which substantially decreases their visibility.

The abandoned homestead known as the Weaver Place, influences only a small portion of the study area.

The fences and wood pole corral have an extremely small influence on the area's naturalness. The fences are screened by vegetation and topography. Although the corral is in a clearing, nearby vegetation screens it from a distance.

Table 1. Summary of Proposed Management Under Each Alternative, South Fork of the Donner und Blitzen River WSA (OR-2-85G)

Proposed Management	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
Acres Designated as Wilderness	35,850	35,850	0
Acres Closed to ORVs by Wilderness Designation	35,850	35,850	0
Miles of Ways Closed	27	27	0
Acres of Full Fee Estate Acquired[1]	0	4,420	0
Acres of Split Estate Acquired [1]	0	1,280	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	35,850	35,850	0
Structural Livestock Projects Developed: Fences (miles)	0-4	0-4	4

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identification difficult. This problem is compounded by the presence of the "L" shaped extension which is nearly surrounded by unmarked private land.

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The abandoned homestead known as the Weaver Place, influences only a small portion of the study area.

The fences and wood pole corral have an extremely small influence on the area's naturalness. The fences are screened by vegetation and topography. Although the corral is in a clearing, nearby vegetation screens it from a distance.

The influence of outside sights and sounds on the area is insignificant. Most of the outside developments which can be seen from within the area are boundary roads. Nearly all of these roads can be seen from short distances into the study area from the perimeter, but they do not detract from the natural appearance of the WSA. There are 4 reservoirs outside the WSA which also have minor effects on the naturalness of the WSA.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude in the South Fork WSA are outstanding. These opportunities are enhanced by the area's large size and diverse topography. Numerous shallow drainages in the western portion of the study area provide opportunities for a visitor to find seclusion. The deeper canyons of the Donner und Blitzen River and its tributaries also contribute to solitude.

Vegetative screening also enhances opportunities for solitude, mostly from juniper which is one of the dominant species of the WSA. Although some aspen and riparian species also occur in the area, they are not a major factor in enhancing solitude.

Opportunities for primitive and unconfined types of recreation in this WSA are outstanding. These include day hiking, backpacking, camping, hunting, fishing, and horseback riding.

Opportunities for day hiking within the WSA are good. The primary attraction of the area would be the South Fork of the Blitzen River. The river and its tributaries provide many different routes for hikes of varying degrees of difficulty. The streams and riparian vegetation provide pleasant surroundings to hike in.

The eastern portion of the area contains juniper and topographic screening which would enhance the backpacking or camping experience. Although it may require purification, water is available throughout the WSA, as are adequate camping spots.

Horseback riding, like backpacking, would be of high quality. Most of the terrain in the study area is relatively accessible by horses. However, there may be some difficulty in gaining access in the South Fork canyon.

Game species which can be hunted within the area include mule deer, antelope and upland game birds. The southwestern portion of the WSA offers good opportunities for hunting antelope, while the eastern and southeastern area offer good deer hunting. Chukars can be found along the rimrocks throughout the WSA, but the quality of chukar hunting is low.

Special Features

There are several features which add to the value of this area as wilderness, including vegetation and wildlife.

A plant species of special interest is found in the WSA: *Eriogonum cusickii*. (This plant is discussed further in the Vegetation section.)

Wildlife is a special feature because of a sage grouse strutting ground located in the northwestern portion of the WSA. This is a site where the sage grouse conduct an extensive courtship dance prior to mating. The same area is often used year after year, and the birds usually nest within a 2-mile radius of the grounds.

The WSA also contains redband trout, a native fish with limited range.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the South Fork of the Donner und Blitzen River WSA is located in the Intermountain Sagebrush Province and its potential natural vegetation is sagebrush steppe.

The Basin and Range section of the Oregon Natural Heritage Plan identifies six communities which occur in this WSA: western juniper/big sagebrush/Idaho fescue, western juniper/low sagebrush/Sandberg's bluegrass, western juniper/big sagebrush/bluebunch wheatgrass, big sagebrush/Idaho fescue, low sagebrush/Idaho fescue, and low sagebrush/Sandberg's bluegrass.

The WSA is within 5 hours' driving time of one standard metropolitan statistical area: Boise, Idaho.

Energy and Mineral Development

The geology, energy, and mineral resources of the South Fork of the Donner und Blitzen River WSA were evaluated by interpreting existing literature, reviewing mining claim and mineral leasing records, and correlating rock units in the WSA with similar environments in other areas that are known to contain mineral deposits. Technical details of the findings of the evaluation are in a report of the assessment of mineral resources, Catlow Rim Geologic Resource Area (GRA OR-020-20), Harney County, Oregon, prepared by TERRADATA, a BLM contractor, and in a BLM report on the assessment of mineral resources in the South Harney Geologic Resource Area.

The WSA is within the geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

Diatomite is rated moderately favorable in a portion of the WSA. This rating is based on the presence of tuffaceous lacustrine sediments similar to those in other Tertiary basins in southeastern Oregon which are known to contain diatomite.

Table 3 shows the mineral potential classifications in the WSA. Map 4 shows the portion of the WSA rated moderate (medium) for diatomite.

Aside from abundant road aggregate sources, there are no known occurrences of mineral deposits within the WSA. There were 5 oil and gas leases as of January 1, 1984, covering 17,525 acres within the WSA. There were no other mineral leases or mining claims as of January 1, 1984.

The surface rocks are composed mainly of Steens Basalt which consists of numerous thin flows of olivine basalt with a cumulative thickness of several thousand feet and rare interlayers of tuff. Locally the area is overlain with semiconsolidated lacustrine (lake) tuffaceous sediments and ash flow tuffs.

Table 3. Classification of Energy and Mineral Potential, South Fork of the Donner und Blitzen River WSA (OR-2-85G)

Commodity	Area	Classification Level	Confidence Level
Metals	Entire WSA	1	B
Geothermal	Entire WSA	1	D
Uranium/Thorium	Entire WSA	1	A
Coal	Entire WSA	1	B
Oil/Gas	Entire WSA	2	A
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	C
Bentonite	Entire WSA	1	A
Diatomite	See map 4	3	C
	Rest of WSA	1	B
Zeolites	Entire WSA	1	A

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

Vegetation

The major plant communities in the South Fork WSA are a low sagebrush/bunchgrass community and juniper dominated communities.

Low sagebrush/bunchgrass is the most extensive community and occurs on the plateaus and flat ridgetops. Large portions of this community have been invaded by juniper. The estimated successional stage of the low sagebrush community is mid to late seral. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) Climax vegetation will vary with the soil depth. On shallow soils, the climax vegetation is low sagebrush and Sandberg's bluegrass. Idaho fescue replaces Sandberg's bluegrass on the deeper soils.

Scattered throughout the low sagebrush community are small juniper covered rock outcrops. The successional stage is estimated to be mid to late seral and the probable climax vegetation is juniper and bluebunch wheatgrass.

Another community which occurs in conjunction with the low sagebrush community is a big sagebrush/Idaho fescue community. This community has also been heavily invaded by juniper in some places. The estimated successional stage is mid-seral, and the major climax species are Idaho fescue and big sagebrush.

The other major vegetative community is dominated by western juniper and big sagebrush. This community occurs on the slopes of the canyons. The estimated successional stage of these slopes is mid-seral. Climax vegetation is bluebunch wheatgrass and big sagebrush on the south slopes and Idaho Fescue and big sagebrush on the north slopes. Much of the juniper in the canyons is very old and may be considered part of the climax community.

Two other small but very distinct and important communities located in the eastern part of the WSA are mountain big sagebrush/grass and the riparian zone. The estimated successional stage is mid-seral. The probable climax vegetation is mountain brome, western needlegrass, bluegrass, and mountain big sagebrush.

Riparian areas exist primarily along the Blitzen River and its major tributaries, Ankle Creek, Indian Creek and Deep Creek. The major riparian species are willow, dogwood, alder, chokecherry, and aspen. The successional stage of the riparian zone varies from early to late seral. Climax species are not clearly known, but probably include the aforementioned shrubs as well as forbs and grasses.

A plant species of special interest (mentioned in the Special Features section) has been identified within this WSA: *Eriogonum cusickii* (Cusick's buckwheat). This plant is a candidate species for federal listing as threatened or endangered, and is found in the northern portion of the area near Blitzen Crossing.

Wildlife

The WSA provides habitat for wildlife species common to the mosaic of low sagebrush, western juniper, big sagebrush and riparian habitat types on Steens Mountain. Aspen groves provide a limited amount of habitat for those wildlife species utilizing trees for nesting, foraging, and roosting.

Most of the study area is relatively open and provides good deer and antelope summer range. Most of the deer summer range occurs east of the Blitzen River.

Raptors commonly using the area during the summer include red-tailed hawks, golden eagles, prairie falcons, marsh hawks, and American kestrels. Occasional raptor nests have been located within the WSA. Other nongame species found in the study area include black-tailed jackrabbit, mountain cottontail, Brewer's sparrow, western meadowlark, sage thrasher, and common flicker.

Eleven miles of riparian habitat is found on the public land in the WSA. This includes the river, the three larger creeks and several intermittent streams. Species of wildlife common to riparian habitat include rock wrens, Brewer's sparrow, yellow-rumped warbler, Cassin's finch, and beaver. Redband trout are found in 8 1/2 miles of stream of which 6 miles are in the South Fork of the Blitzen River.

Livestock Grazing

The WSA is entirely within the South Steens grazing allotment. Table 4 shows existing and potential livestock use in AUMs (animal unit month, the amount of forage required by one cow and calf, or equivalent animals, for one month).

Existing livestock developments (among the man-made features discussed in the Naturalness section) include 13 reservoirs, a corral, and 2 miles of fence.

A fence is proposed to be constructed within the WSA to improve livestock management through better grazing distribution. Four miles of the fence would run through the WSA. This would increase forage production within the WSA and could result in a possible increase of licensed livestock use of up to 1,950 AUMs in the allotment.

Table 4. Existing and Potential Livestock Use, South Fork of the Donner und Blitzen River WSA (OR-2-85G)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs) [1]
South Steens (No. 6002)	21,935	04/16-10/31	15	4,800	1,950

[1] Increases might or might not result in increased licensed use in the allotment (see narrative).

Grazing operators presently use motorized vehicles frequently within the WSA primarily for use-supervision and salting. Horses are also used to manage livestock in that area.

Recreation Use

Recreation use in the South Fork WSA is primarily oriented toward hunting and fishing. Mule deer, antelope, and upland game birds are the most commonly hunted game species.

Hunting within this WSA is considered good. The study area is within both deer and antelope summer ranges so the animals are present during their respective hunting seasons. Antelope hunting is especially good within the southwestern portion of the area. Hunter use for antelope in this WSA is moderate. Deer hunting is considered good for the eastern portions of the WSA including the "L" shaped parcel in the southeast. Deer hunting use within the study area is high.

Upland game species such as chukar and sage grouse are also present within the study area, but hunting for these birds is considered poor. The area receives low use for upland game hunting.

Fishing in the portion of the Donner und Blitzen River within the WSA is considered excellent by the Oregon Department of Fish and Wildlife. The chance to catch Redband trout attracts many anglers to this portion of the river and its tributaries. Fishing use on the public lands within this study area is high, with the South Fork accounting for the majority of the fishing while Indian Creek has less use and Deep Creek the least.

Hunters and fishermen commonly use motorized vehicles to gain access within the WSA. However, a good portion of the South Fork is not accessible by vehicle, so most fishermen must hike to gain access for their sport.

The study area receives little primitive recreation use not associated with hunting or fishing. The area receives low use which can be attributed to primitive recreation such as day hiking, backpacking, sightseeing or wildlife viewing.

Economic Value and Local Income

Livestock grazing, oil and gas leasing and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were 5 oil and gas leases and no geothermal leases on the WSA.

Economic value and local personal income generated from existing levels of resource outputs of these lands are presented in table 5. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The all wilderness alternative would add 35,850 acres to the National Wilderness Preservation System (NWPS). It would preserve the South Fork of the Blitzen River and the tributaries of Ankle Creek, Deep Creek and Indian Creek, which are the major physical features within the WSA.

Wilderness designation under this alternative would maintain or improve the natural qualities of the area, as well as the outstanding opportunities for solitude and primitive recreation. Closure of 11 vehicle ways totaling about 27 miles would improve the naturalness of the area by eliminating most vehicle use and allowing the ways to revegetate. Closing the ways would also improve the opportunities for solitude and the quality of primitive recreation by eliminating vehicle use.

Continued use of vehicles for access by owners of inholdings would adversely affect solitude, depending on the amount of such use. It might also affect the naturalness of the area by not allowing ways to revegetate.

Wilderness designation would protect from

Table 5. Economic Value and Local Personal Income Generated Annually, Existing Program, South Fork of the Donner und Blitzen River WSA (OR-2-85G) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	4,800	$36,192	$40,176
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil and Gas Leases	Acres	17,525	17,525	5,278
Total			$53,717	$45,454

development the special features of the WSA, including the plant species of special interest, and a sage grouse strutting area.

The scenic values of the area would be preserved by precluding major developments within the WSA. Potential mineral development would be totally or partially eliminated under the all wilderness alternative. This would also preserve existing wilderness values throughout the area.

The **enhanced wilderness alternative** would add 41,550 acres to the NWPS, assuming acquisition of 5,700 acres of private and split-estate land. The effects of this alternative, including those of closing 27 miles of ways, would be similar to those described under the all wilderness alternative. However, the enhanced wilderness alternative would also preclude possible development of the scattered split-estate and private lands within and adjacent to the WSA through the acquisition of these lands. Most of these lands are located in areas identified as having low favorability for the occurrence of minerals and there are no known plans for mineral or other types of development. The potential for manageability problems arising from future development and the need for access to inholdings or potential problems from recreational use of these lands would be eliminated under this alternative.

Under the **no wilderness/no action alternative**, wilderness values of the entire WSA would be subject to disturbance from any developments such as possible mineral development. Naturalness of the area and the wildlife values (sage grouse strutting ground) identified as special features would be adversely affected by any surface disturbing activities which could occur. Opportunities for solitude and primitive recreation could be adversely affected as a result of any additional vehicle access and use associated with new developments.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development: 35,850 acres under the **all wilderness alternative**, and 35,850 acres, plus an additional 5,700 acres if split-estate and private land is acquired, as proposed under the **enhanced wilderness alternative**. Under each of these alternatives, 1,997 acres rated moderately favorable for the occurrence of diatomite would be included in the withdrawal.

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness.

The South Fork of the Blitzen River and its tributaries need increased streambank stability and improved riparian cover to improve wildlife and aquatic habitat. This can be accomplished by a grazing system requiring fencing. Failure to implement a grazing system would keep the riparian and aquatic habitat in it's current poor condition and keep wildlife and fish populations slightly lower.

The project might be appropriate in wilderness because it would correct the adverse effects of man's influence. A site-specific assessment would be prepared to determine if it conformed with Wilderness Management Policy.

Under the **all and enhanced wilderness alternative**, the opportunity to improve wildlife riparian habitat and slightly increase wildlife and fish populations would be foregone if it did not comply with Wilderness Management Policy. Riparian habitat would remain in its present, poor condition.

Under the **no wilderness/no action alternative**, the proposed improvement (fence) could be implemented, benefitting wildlife and aquatic species because of improved shrub and tree cover and more stable streambanks.

Effects on Livestock Grazing

Under the **all and enhanced wilderness alternatives**, the fence proposed within the WSA might or might not be allowed, depending on a site-specific analysis of whether it conforms with Wilderness Management Policy. If not allowed, an opportunity to improve forage production in the WSA through better management and an improved grazing system would be foregone. Possible increases in licensed livestock use of up to 1,950 AUMs would also be foregone.

The proposed fence has a benefit/cost ratio greater than 1:1.

Under the all and enhanced wilderness alternatives, the interior ways would be closed, making it inconvenient for the grazing operator to spread salt and monitor livestock use. Horses can be used for some of the jobs presently being done with motor vehicles.

Under the **no wilderness/no action alternative**, the fence would be constructed, allowing improved management and increasing the forage production in the WSA.

Under all of the alternatives, the forage produced from improved management allowed by the proposed project (up to 1,950 AUMs) may be licensed if it is sustainable and all forage needs in the allotment have been considered.

Effects on Recreation Use

The quality of and opportunities for primitive recreation in the study area would be maintained or improved under the **all and enhanced wilderness alternatives**. Improvements in the quality of primitive recreation would result from the elimination of vehicles on ways throughout the WSA under both alternatives.

The all and enhanced wilderness alternatives would reduce or eliminate vehicle-oriented recreation from the area, mostly affecting hunting for deer and antelope, which is not substantial.

Some of the reduction in visitor days from vehicle-oriented hunting could be offset by increased use from hunters who do not use vehicles as a means of transportation within their hunting areas. Fishing within the WSA would remain the same because most fishermen walk to their destination.

With the exception of fishing activities which are not dependent on vehicles for access, existing use of the area for primitive recreation is limited. Primitive recreation use (including fishing) would not increase substantially under the all wilderness or enhanced wilderness alternatives. Any expected increase in primitive recreation use would not be sufficient to offset the reduction in vehicle-oriented recreation.

Under the **no wilderness/no action alternative**, primitive recreation use would be subject to continued disturbance by existing vehicle access routes and use. Vehicle-oriented recreation could benefit from additional access which might be associated with the development of livestock projects. Overall, recreation use would not be significantly affected.

If the proposed livestock fence is constructed under any alternative, improved wildlife and aquatic habitat could result in increased numbers of big game and fish, which could lead to slight increases in recreation use in the study area. Such increases would not affect overall recreation use under any alternative.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 6 and 7. Table 6 shows the effects on economic value and table 7, the effects on local personal income. It is not known at this time whether individual proposed structural developments would be constructed if the area were designated wilderness.

The columns for the wilderness alternatives show the effects as a range of values dependent upon whether structural improvements, and/or grazing operator access, were allowed.

Vehicles are currently used for livestock management in the study area. The all wilderness and enhanced wilderness alternatives would restrict such vehicle use unless there were no practical alternative. The maximum impact from vehicle restrictions on the grazing operator in the WSA would be an increase in cost of about $319 per year.

Table 6. Effects of Alternatives on Annual Economic Value, South Fork of the Donner und Blitzen River WSA (OR-2-85G) (1981 price levels)

Item	Unit of Measure	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +1,950	0 to +1,950	+1,950
Big game hunting [1]	RVD	0 to +38	0 to +38	+38
Fishing [1]	RVD	0 to +79	0 to +79	+79
Oil and Gas Leases	Acres	-17,525	-21,085	0
VALUE OF PLANNED INVESTMENTS [2]				
Grazing	$	0 to +14,703	0 to +14,703	+14,703
Big game hunting	$	0 to +862	0 to +862	+862
Fishing	$	0 to +1,568	0 to +1,568	+1,568
Total [3]	$	0 to +17,133	0 to +17,133	+17,133
Investments [4]	$	0 to -757	0 to -757	-757
Net Economic Value	$	0 to +16,376	0 to +16,376	+16,376
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS				
Reduced access [5]	$	-319	-319	0
Oil and Gas Leases	$	-17,525	-21,085	0
Total	$	-17,844	-21,404	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS				
All categories	$	-17,844 to -1,468	-21,404 to -5,028	+16,376

[1] Expected future increases due to proposed range (livestock) improvement investments.

[2] Structural projects involving up to $9,400. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Detail may not sum to "Total" due to rounding.

[4] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[5] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 7. Effects of Alternatives on Local Personal Income, South Fork of the Donner und Blitzen River WSA (OR-2-85G) (1981 price levels)

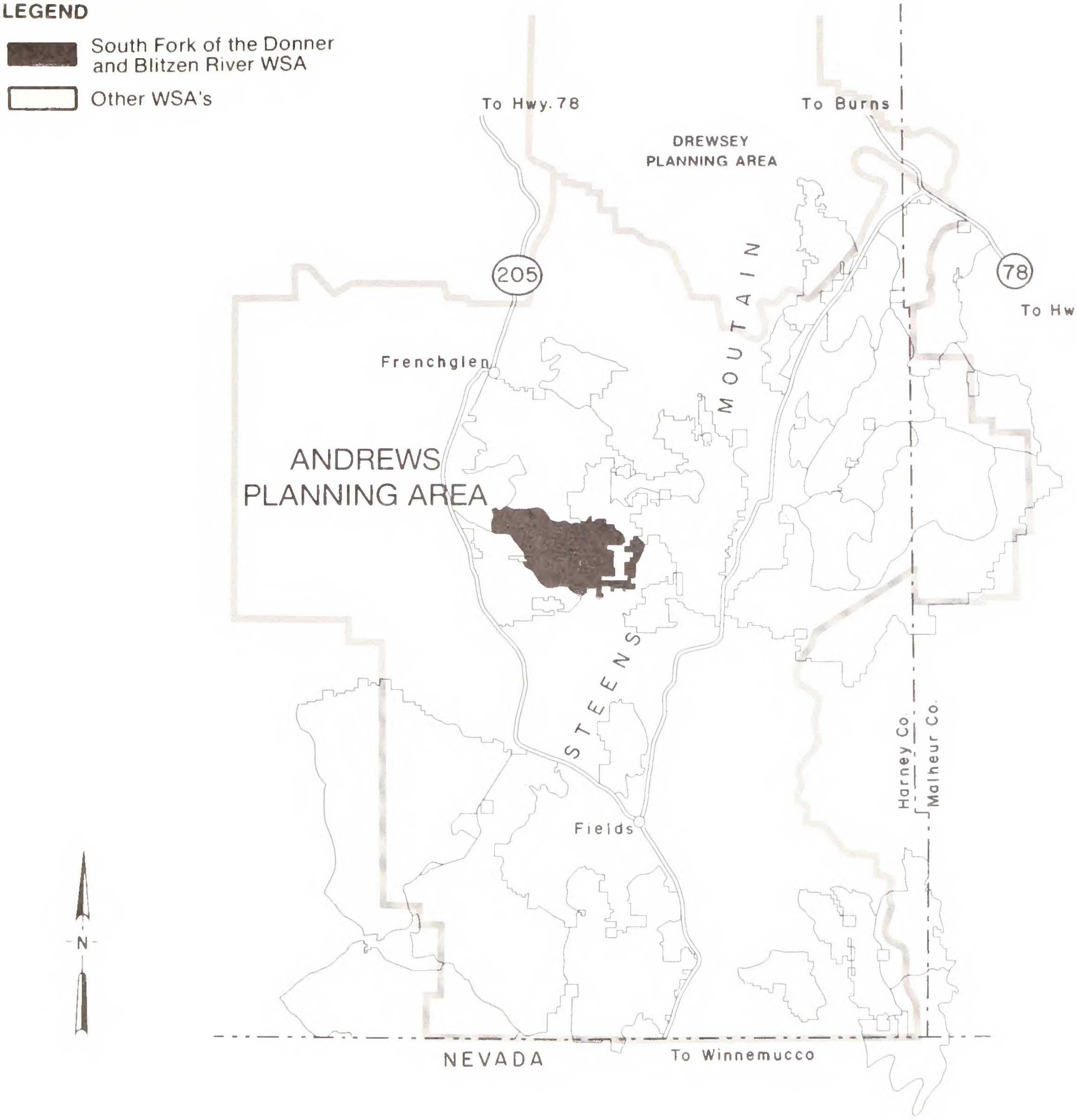
Item	Unit of Measure	All Wilderness	Enhanced Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Grazing:				
Investment [1]	AUM	0 to +1,950	0 to +1,950	+1,950
Big game hunting [1]	RVD	0 to +38	0 to +38	+38
Fishing [1]	RVD	0 to +79	0 to +79	+79
Oil and Gas Leases	Acres	-17,525	-21,085	0
INCOME FROM PROPOSED INVESTMENTS [2]				
Grazing	$	0 to +16,322	0 to +16,322	+16,322
Big game hunting	$	0 to +377	0 to +377	+377
Fishing	$	0 to +901	0 to +901	+901
Construction Activity [3]	$	0 to +1,263	0 to +1,263	+1,263
Total [4]	$	0 to +17,600	0 to +17,600	+17,600
INCOME FROM OTHER EXPECTED OUTPUT CHANGES				
Oil and Gas Leases	$	-5,278	-6,350	0
INCOME FROM ALL OUTPUT CHANGES				
All categories	$	-5,278 to +12,322	-6,350 to +11,250	+17,600

[1] Expected future increases due to proposed range (livestock) improvement investments.

[2] Structural projects involving up to $9,400. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[3] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[4] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 3.



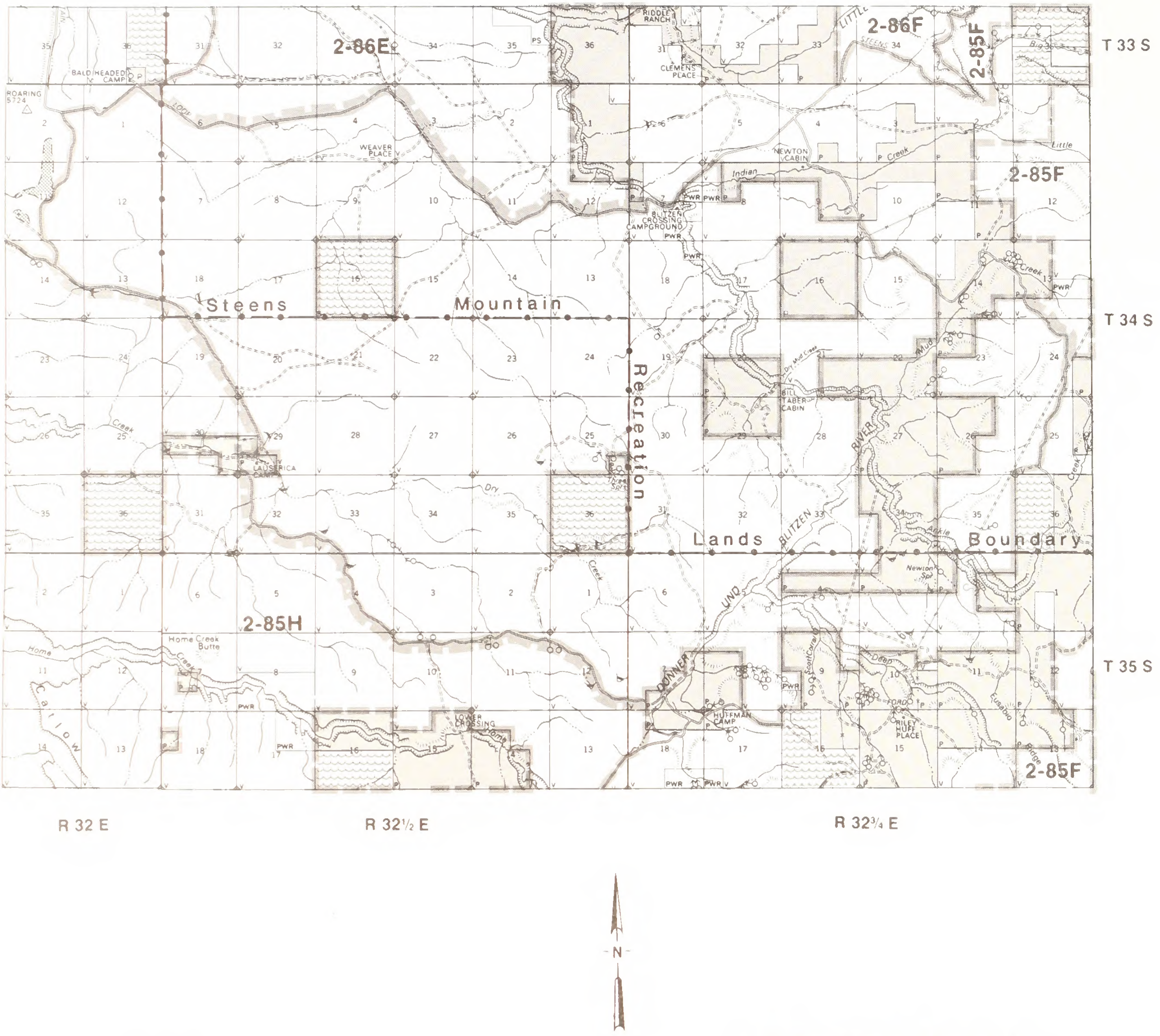
U. S. Department of the Interior
Bureau of Land Management
Burns District

South Fork of the Donner und Blitzen River WSA
OR-2-85G

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

- ▬ Wilderness Study Area Boundary
- ▬ ▬ Boundary of Adjacent Wilderness Study Areas
- ☐ Bureau of Land Management
- ▨ Private
- ▤ BLM Surface-State or Private Subsurface (Split Estate)

U. S. Department of the Interior
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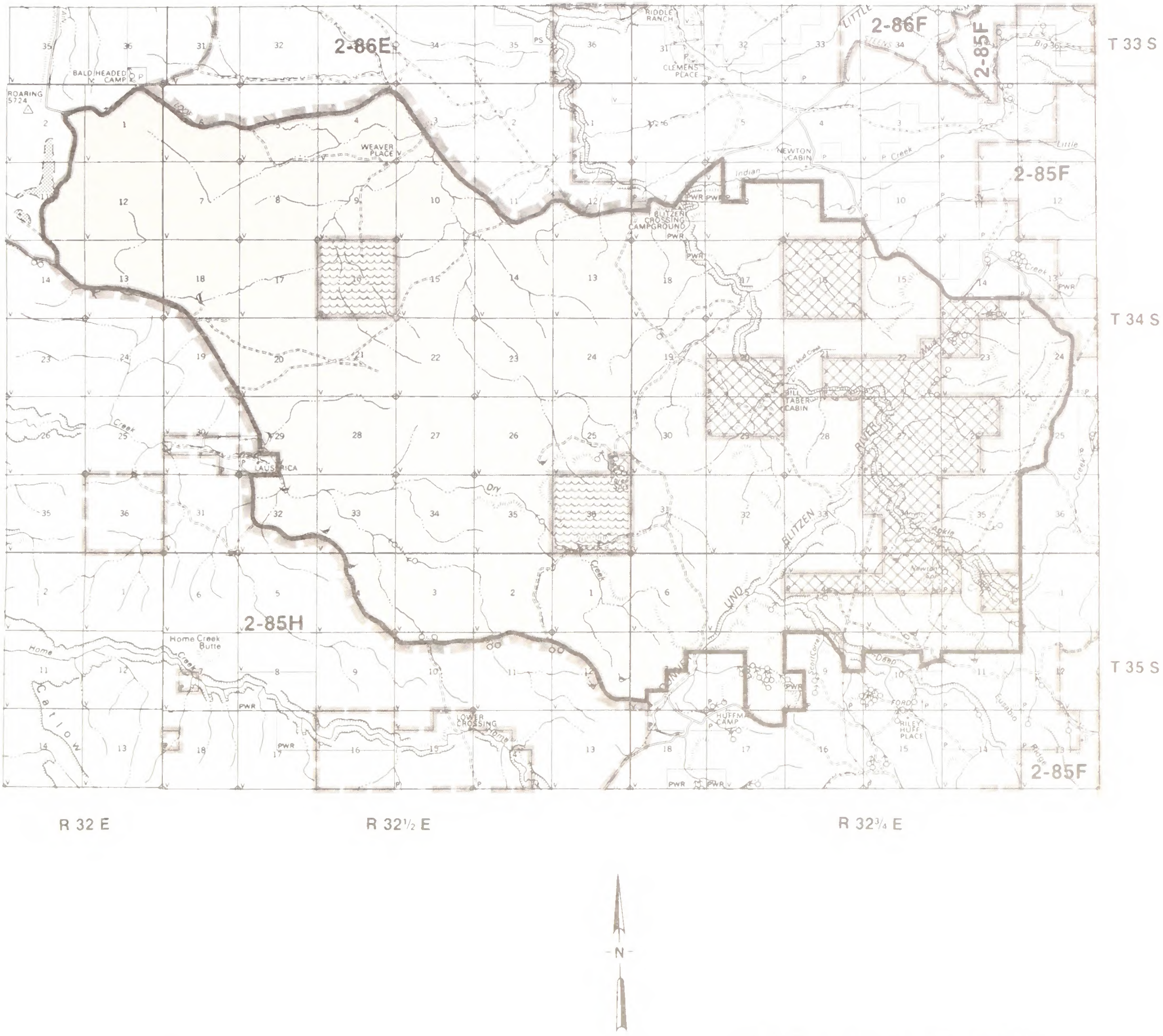
Burns District

South Fork of the Donner und Blitzen River WSA
OR-2-85G

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

▬ Wilderness Study Area Boundary

╍ Boundary of Adjacent Wilderness Study Areas

☐ Recommended Suitable for Wilderness

▩ Non-Federal Land within Recommended Wilderness

▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

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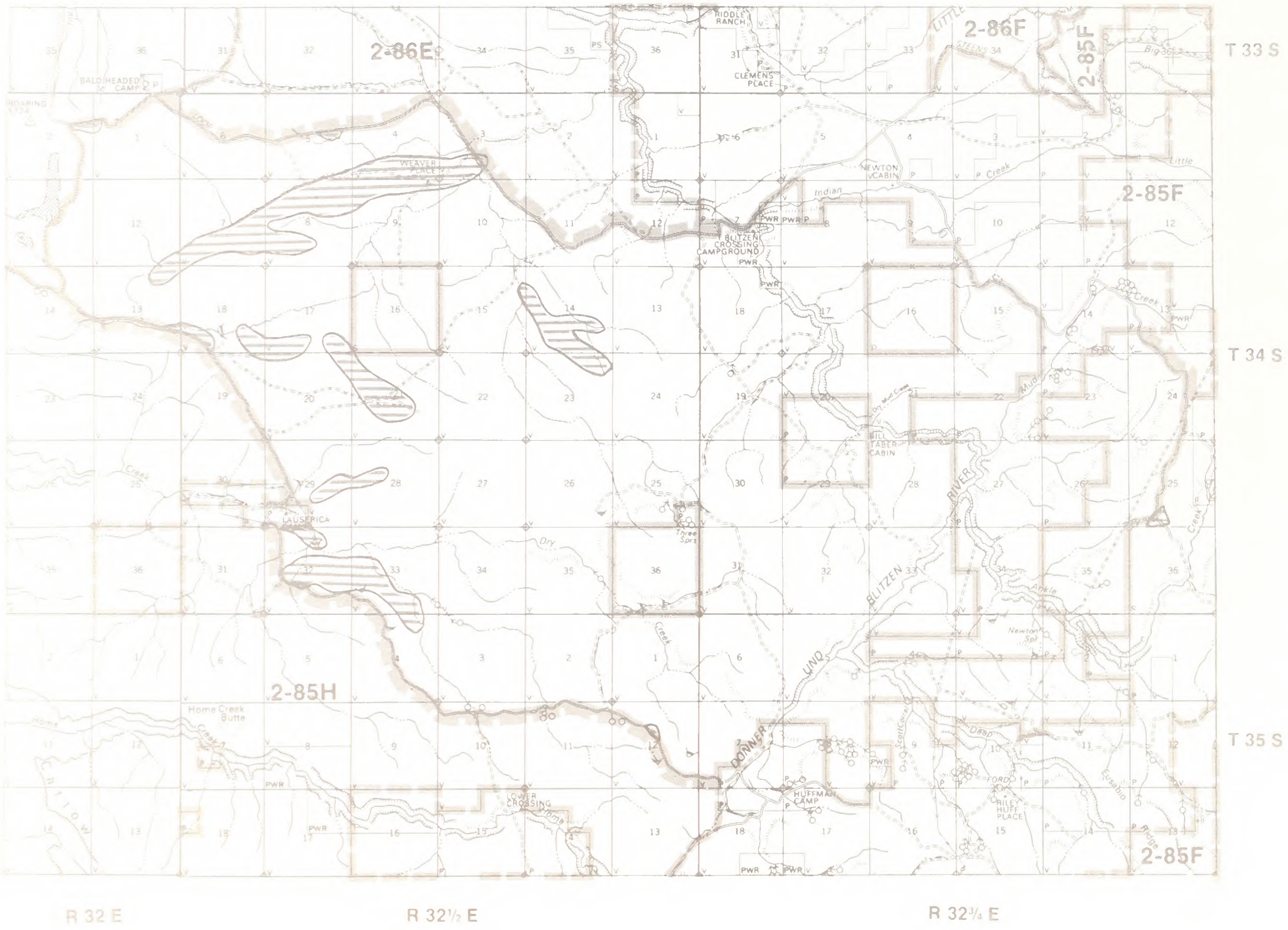
South Fork of the Donner und Blitzen River WSA
OR-2-85G

ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3



N

▤ **Medium Potential (3C) for Diatomite**

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Bureau of Land Management
Burns District

South Fork of the Donner und Blitzen River WSA
OR-2-85G

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 4

South Fork of the Donner und Blitzen River WSA, OR-2-85G. This view shows the river as it winds its way north through the eastern portion of the study area. Within the area recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. The snowcapped upper elevations of Steens Mountain, to the north, can be seen on the horizon. The river corridor offers outstanding opportunities for a variety of recreational activities. May 1981.

South Fork of the Donner und Blitzen River WSA, OR-2-85G. The east side of the South Fork of the Donner und Blitzen River looking north.Recommended suitable under the enhanced and nonsuitable under the preferred (no wilderness/no action) alternative. The ridgeline is in the High Steens WSA (OR-2-85F) to the north and east. The dead juniper in the middle ground is the result of a fire which burned the area in 1981. August 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Home Creek Wilderness Study Area (OR-2-85H)

General Description of the Study Area

The Home Creek wilderness study area (WSA) is located 63 miles south of Burns (13 miles south of Frenchglen) in Harney County (see map 1). The area lies adjacent to the county road which extends south of Oregon State Highway 205. The State Highway ends less than one mile north of the WSA.

The study area is roughly triangular in shape and contains 25,120 acres of public land (see map 2). Included within the study area are two privately owned parcels of 35 and 40 acres and a split-estate section of 640 acres, all located near the center of the study area. The boundaries of the area are composed primarily of roads and private land with a small amount of split-estate land (federally managed surface, state or privately owned subsurface mineral rights) also forming part of the boundary.

The major physical features of the Home Creek WSA are Catlow Rim, the plateau area, and the three drainages of Dry, Home and Threemile Creeks.

Along the western side of the WSA is Catlow Rim, a steep, rocky westerly facing escarpment rising 800 to 1500 feet above Catlow Valley. The very western edge of the WSA contains a portion of the eastern edge of Catlow Valley, where the study area reaches its lowest elevation of 4,580 feet.

From the top of Catlow Rim, the eastern three quarters of the WSA is a gently rolling plateau. This plateau is the western side of the Steens Mountain Fault Block. It is on this plateau, in the southern end of the study area, that the area's highest elevation is reached, 6,461 feet.

The 9-mile length of the Catlow Rim in the Home Creek WSA is deeply cut in three locations. Draining the extreme western slopes of Steens Mountain and emptying into the Catlow Valley are Dry Creek, Home Creek, and Threemile Creek. As a result of erosion over centuries, these creeks have carved large canyons through the face of the rim.

Home Creek is the only stream in the WSA which is perennial over its entire length. Home Creek Canyon cuts into the plateau with a depth of 300 to 1200 feet for over 2 1/2 miles and is the longest and steepest of the three canyons. With sheer rock walls, the canyon rises 1,200 feet in about 1/4 mile. The remaining 2 1/2 miles of Home Creek in the WSA are in a fairly shallow canyon just over 100 feet deep.

Threemile Creek Canyon is the deepest of the three canyons. At its deepest point, the creek is 1,500 feet below the rim of the canyon. Of the three miles in the study area, only the lower two miles contain running water throughout the year.

Dry Creek Canyon is the smallest of the three canyons. It ranges from 300 to 800 feet in depth and does not contain a perennial stream.

The major vegetative communities in the area are dominated by low sagebrush and western juniper. A variety of grasses are also found within the WSA, and riparian vegetation occurs in the drainages of Home and Threemile Creeks.

Interrelationships

Adjacent to the eastern boundary of the study area is the South Fork of The Donner und Blitzen River wilderness study area (OR-2-85G), separated from the Home Creek WSA by a BLM road and a small amount of private land. The road is maintained on an as-needed basis and used by BLM, private landowners and recreationists for access to the central portion of the Steens Mountain area.

The Oregon Department of Fish and Wildlife (ODFW) has identified the Catlow Rim area between Dry Creek and Threemile Creek as potential yearlong habitat for California bighorn sheep. They have proposed to release sheep in the area sometime prior to 1987 as a part of a program to reintroduce bighorns to their former range. This site is one of six identified in BLM's Burns District as a potential transplant site and ranks sixth on the ODFW's priority list for the area.

In previous years, ODFW has removed redband trout (for hatcheries) from Threemile Reservoir located south of the WSA. The reservoir is fed by Threemile Creek, one of the watersheds within the study area.

ODFW does an annual count of a sage grouse strutting ground in the WSA.

Most of the WSA is in the South Steens wild horse herd management area (HMA). HMA management will not be significantly affected by any of the alternatives.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- potential exploration and development of mineral resources,

- existing vehicle use in the area, particularly for hunting and fishing,

- management of wild horses in the area (See Statewide EIS volume), and

- potential increased recreation use under wilderness designation, particularly adverse effects of such use on the area's other resource values. (BLM's wilderness management policy states that recreation use would be managed to protect the area's wilderness values.)

Also raised as an issue was the possibility of combining this WSA with the adjacent South Fork of the Donner und Blitzen River WSA to form a single, larger wilderness area.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- partial (preferred alternative)
- no wilderness/no action

An enhanced wilderness alternative is not analyzed for this study area because it would not be significantly different from the all wilderness alternative. Combining Home Creek and the adjacent WSA by closing the road between them is not considered to be a feasible alternative; the road serves as needed access to private and public land outside the study areas and cannot be closed.

All Wilderness

The all wilderness alternative would recommend all 25,120 acres of public land in the study area suitable as wilderness (see map 2). For purposes of analysis, it is assumed that none of the private or split-estate inholdings would be acquired.

Partial (Preferred Alternative)

Under the partial alternative, 21,000 acres of public land would be recommended suitable for designation as wilderness and 4,120 acres nonsuitable for wilderness (see map 3). Also, an attempt would be made to acquire the split-estate and private inholdings (640 and 75 acres, respectively). In addition, the recommended boundary would include acquisition of 45 acres of private and 375 acres of split-estate land along the western side of the study area. These parcels could be acquired through purchase or exchange with willing landowners. Assuming acquisition of these parcels, total area recommended suitable under this alternative would be 22,135 acres.

The partial alternative retains the area's basic configuration. The entire western boundary would be located at the 4,700-foot level (along the base of Catlow Rim). Approximately 1,000 acres of WSA west of and below the 4,700-foot contour would be outside the wilderness. This would enhance manageability of the area by avoiding the irregular configuration of legal subdivisions on this side of the WSA and making the boundary more identifiable on the ground.

The southeastern boundary would exclude a small portion of the area east of what is referred to as the Lower Crossing Road. Identified in the WSA inventory as a way (a vehicle route established and maintained solely by the passage of vehicles), this route provides access to surrounding public and private lands; it would become part of the boundary, allowing continued use. Approximately 2,560 acres of the WSA would be recommended as nonsuitable for wilderness as a result of this adjustment. The remainder of the southern boundary would be a legal subdivision. As a result, 560 acres would be recommended as nonsuitable for wilderness. The parcel is surrounded by adjacent private land, would not have an identifiable boundary, and would be difficult to manage as wilderness.

Those portions of the Home Creek WSA which were recommended nonsuitable under this alternative would be managed much as they are at the present time. Livestock grazing and vehicle-oriented recreational activities would continue. The lands would also be available for energy and mineral exploration and development.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued use of vehicles throughout the study area, for hunting, sightseeing, etc., and

- continued availability for mineral exploration and development.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The Home Creek wilderness study area would be manageable as wilderness under both the all wilderness alternative and partial alternatives (preferred). Relatively minor manageability problems with boundary identification under the all wilderness alternative would be resolved under the partial alternative by recommending small portions of the area as nonsuitable for wilderness and by recommending acquisition of small parcels of private and split-estate land.

Table 1. Summary of Proposed Management Under Each Alternative, Home Creek WSA (OR-2-85H)

Proposed Management	All Wilderness	Partial	No Wilderness/ No Action
Acres Designated as Wilderness	25,120	21,000	0
Acres Closed to ORVs by Wilderness Designation	25,120	21,000	0
Acres of Full Fee Estate Acquired [1]	0	120	0
Acres of Split Estate Acquired [1]	0	1,015	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	25,120	21,000	0
Structural Wildlife Projects Developed: Fences (miles)	0-2	0-2	2

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing

Table 2. Summary of Environmental Consequences of Alternatives, Home Creek WSA (OR-2-85H)

Resource or Activity	All Wilderness	Partial (Preferred Alternative)	No Wilderness/No Action
Wilderness Values	Would add 25,120 acres to NWPS, including a portion of Catlow Rim and Home and Threemile Creek Canyons and their associated geologic, wildlife (raptors) and scenic values. Maintains or improves the quality of the area's wilderness characteristics and protects the special features. Although minor manageability problems might occur due to poor boundary identification, the area would be manageable as wilderness.	Would add 22,135 acres to NWPS, assuming acquisition of 1,135 acres of private and split-estate land. Preserves all of the features identified in the all wilderness alternative. Improves manageability by locating the boundary along a more readily identifiable line. Acquisition of inholdings and adjacent private and split-estate parcels would enhance wilderness values.	Wilderness values and special features would be subject to possible disturbance from any future development.
Energy and Mineral Development	Development precluded on 25,120 acres, including 771 acres, with moderate potential for diatomite.	Development precluded on 21,000 acres plus an additional 1,135 acres if private and split-estate land is acquired. Includes 492 acres with moderate potential for diatomite.	No impact.
Wildlife	Wildlife habitat preserved. Opportunity to improve wildlife riparian habitat may be foregone.	Same as all wilderness, except wildlife habitat preserved in suitable area.	Wildlife habitat improved by fencing along Home and Threemile Creek.
Livestock Grazing	Possible retrictions on use of vehicles for livestock management.	Same as all wilderness in suitable portion.	No impact.
Recreation Use	Use of motorized vehicles restricted to boundary roads. Some loss in overall recreation use as a result of prohibiting vehicle use of ways.	Same as all wilderness for portion recommended suitable.	No significant impact.
Economic Value and Local Income	Decrease in economic value and local personal income by $9,683 and $2,903 respectively, primarily from loss of oil and gas leases. The maximum increase in transportation costs to ranchers with grazing permits would be $45.	Decrease in economic value and local personal income by $6,399 and $1,917, respectively, primarily from loss of oil and gas leases. Maximum increases in transportation costs to ranchers with grazing permits would be $29.	No impact.

Rationale for Selection of the Preferred Alternative

The partial alternative is preferred because the Home Creek wilderness study area contains a number and variety of wilderness values. The WSA is in a basically natural condition and possesses outstanding opportunities for solitude and primitive types of recreation. The WSA has special features including scenic qualities, an area of geological interest and wildlife habitat. Designation of the Home Creek study area as wilderness would protect these special features and help to maintain and improve the Threemile Creek watershed which feeds a downstream reservoir used to supply fish hatchery stock.

Land along the west and south boundaries would be recommended nonsuitable for wilderness to provide a more manageable wilderness boundary. Land in the southeast part of the WSA would be recommended nonsuitable so that a route which provides access to a large area of public and private land could remain open to vehicle use.

Affected Environment

This section discusses only those activities or resources which influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Home Creek WSA is in an exceptionally natural condition. There are few developments within the study area, and the effect of the outside developments is minimal.

Sixteen man-made features are located in the WSA: 10 small reservoirs developed for livestock and wildlife, a wildlife guzzler (small wildlife watering device), 3 vehicle ways totaling 6 miles, and 2 fences (totaling about 1 mile). These developments are scattered along the northeastern boundary and visually influence only about 2 percent of the WSA. (The area of influence is an estimate of the acreage within the WSA from which these man-made features can be seen.)

Most of the reservoirs are located on or near the WSA boundary. They are small and can be seen from only small portions of the study area. The ways have only a minor influence on the area's naturalness because they are revegetating and are screened by topography. The fences also have a small impact because they are partially screened by topography or vegetation.

The influence of man-made features outside the WSA boundary is not substantial. Seven reservoirs occur along the northeastern side of the area and can be seen from a very small area within the WSA. The northeastern boundary road also has only a small influence on the naturalness of the area because of topographic and vegetative screening. Agricultural and ranching operations, 3 ranches (Roaring Springs, Home Creek, and Threemile), a powerline and a county road can be seen from the top of Catlow Rim to the western boundary. One or more of these developments can be seen from most points along the rim.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Home Creek WSA offers outstanding opportunities for solitude. These opportunities are enhanced by topographic or vegetative screening throughout much of the WSA.

The WSA could sustain a substantial amount of use without adversely affecting opportunities for solitude. Because of the area's size and the extent of the attractions (the major drainages and the Catlow Rim), visitor use would be relatively dispersed. In addition, solitude is enhanced by topography in portions of the remainder of the area which would also be available for visitors crossing the WSA or seeking features other than the main attractions.

Home Creek WSA offers outstanding opportunities for primitive and unconfined types of recreation, including day hiking, sightseeing, hunting, photography, viewing wildlife, backpacking, camping, horseback riding, and fishing.

Opportunities for day hiking within Home Creek WSA are very good. Primary attractions would be Catlow Rim and Threemile, Home, and Dry Creeks. The length of these drainages and their ruggedness and steepness would be a challenge to the hiker.

These features would also be of interest to a backpacker. Most of the terrain has areas suitable for camping. The limiting factor for overnight stays is the availability of water.

Game species which can be hunted within the area include mule deer, antelope, and chukars, though hunting for mule deer is not of high quality in the area. The general lack of vegetative cover throughout much of the WSA is not conducive to high quality deer habitat. Opportunities for hunting antelope and chukars are excellent in certain portions of the area. Chukar hunting is especially good along the bottom of Catlow Rim, while certain portions of the area along the eastern boundary provide good antelope hunting.

Fishing opportunities in Home Creek and Threemile Creek are considered good. Good populations of redband trout occur in both streams.

Opportunities for observing wildlife, especially raptors along Catlow Rim, sightseeing and photography are also good within this WSA. Catlow Rim, Threemile Creek and Home Creek provide good opportunities for sightseeing and photography. Catlow Rim provides a viewpoint for the surrounding area while the creek drainages provide interesting views within the study area.

Special Features

The Home Creek WSA contains several special features which enhance the value of the study area as wilderness. These include wildlife, geological, and scenic qualities.

Wildlife is a special feature because of high quality raptor nesting and a sage grouse strutting ground. A high concentration of raptor nesting occurs along Catlow Rim and within the steep-walled drainages of the 3 major canyons which cut through the rim. The U.S. Fish and Wildlife Service identified these notable raptor nesting areas in its February 1980 publication, "Important Fish and Wildlife Habitats of Oregon." That study pertains to the entire 31-mile length of the rim and not exclusively to the 9-mile portion within the WSA. Over its length, the rim supports golden eagles, prairie falcons, peregrine falcons (a federally listed endangered species in

Oregon), red-tailed hawks, kestrels, great horned owls, and ravens.

Another wildlife feature is the sage grouse strutting ground. This is a site where sage grouse conduct an extensive courtship dance prior to mating. The same area is often used year after year, and the birds usually nest within a two-mile radius of the area.

Portions of Catlow Rim, including those in the WSA, are potential habitat for bighorn sheep, a species dependent on wild lands and natural conditions.

The WSA contains redband trout, a native fish with limited range.

The geology is a special feature in the study area, primarily Catlow Rim. Catlow Rim is a prominent fault scarp 800 to 1500 feet in height which forms the western edge of the southern topographic unit of the Steens Mountain Fault Block. The rim also serves as the eastern boundary of the Catlow Valley, a prominent structural basin or tectonic depression. The base of Catlow Rim contains ancient shoreline features such as gravel bars, spits, wave-built terraces, and wave-cut benches which are evidence of the lake that occurred in Catlow Valley during the Pleistocene. The area along the rim also provides views of the individual lava flows which make up the Steens Mountain Fault.

Catlow Rim and the major canyons make the area's scenery a special feature. The variety of landform and color, scenic views of the rim and the canyons, and their impressive size all contribute to the high quality scenery.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the study area is in the Intermountain Sagebrush Province, and the potential natural vegetation is sagebrush steppe.

The study area contains 7 ecosystems listed in the Basin and Range section of the Oregon Natural Heritage Plan: low sagebrush/Idaho fescue, western juniper/big sagebrush/Idaho fescue community, western juniper/low sagebrush/Sandberg's bluegrass, big sagebrush/Idaho fescue, low sagebrush/Sandberg's bluegrass, and western juniper/big sagebrush/bluebunch wheatgrass.

Home Creek WSA is within 5 hours' driving time of one standard metropolitan statistical area, Boise, Idaho.

Energy and Mineral Development

The geology, energy, and mineral resources of the Home Creek WSA were evaluated by interpreting existing literature, reviewing mining claim and mineral leasing records, and correlating rock units in the WSA with similar environments in other areas that are known to contain mineral deposits. Technical details of the findings of the evaluation are in a report of the assessment of mineral resources, Catlow Rim Geologic Resource Area (GRA OR-020-20), Harney County, Oregon, prepared by TERRADATA, a BLM contractor, and in a BLM report on the assessment of mineral resources in the South Harney GRA.

The WSA is within the geologic resource areas which have been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

Diatomite is rated moderately favorable for occurrence in a portion of the WSA. The rating is based on the presence of tuffaceous lacustrine sediments similar to those in other Tertiary basins in southeastern Oregon which are known to contain diatomite.

Table 3 shows the mineral potential classifications for the Home Creek WSA. Map 4 shows the portion of the WSA rated moderate (medium) for diatomite.

Aside from abundant road aggregate sources, there are no known occurrences of mineral deposits within the WSA. As of January 1, 1984, there were 5 oil and gas leases covering 9,640 acres within the WSA, and no geothermal leases or mining claims.

The surface rocks are composed mainly of Steens Basalt which consists of numerous thin flows of olivine basalt with a cumulative thickness of several thousand feet and rare interlayers of tuff. Locally, the area is overlain with semiconsolidated lacustrine

Table 3. Classification of Energy and Mineral Potential,Home Creek WSA (OR-2-85H)

Commodity	Area	Classification Level	Confidence Level
Metals	Entire WSA	1	B
Geothermal	Entire WSA	1	D
Uranium/Thorium	Entire WSA	1	A
Coal	Entire WSA	1	B
Oil/Gas	Entire WSA	2	A
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	C
Bentonite	Entire WSA	1	A
Diatomite	See map 4	3	C
	Rest of WSA	1	B
Zeolites	Entire WSA	1	A

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

(lake) tuffaceous sediments and ash flow tuffs.

Vegetation

The two major vegetative communities in the study area exist primarily in conjunction with the two major topographic features, the plateau country east of the rim and the steep canyons.

The most extensive community is dominated by low sagebrush and occurs on the plateau. Pockets of big sagebrush also occur. The estimated successional stage of the low sagebrush community is late seral. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) Climax vegetation varies with soil depth. On shallow soils, climax vegetation is low sagebrush and Sandberg's bluegrass. Idaho fescue replaces Sandberg's bluegrass on the deeper soils.

Scattered throughout the low sagebrush community are small juniper-covered rock outcrops. Other common species are rabbitbrush, sagebrush, bitterbrush, bluebunch wheatgrass, and Sandberg's bluegrass. Successional stage is estimated to be mid to late seral and the probable climax vegetation is juniper and bluebunch wheatgrass.

The other major vegetative community is dominated by western juniper and big sagebrush and occurs in the steep rocky canyons. On the southern exposures, common species are rabbitbrush, bitterbrush, bluebunch wheatgrass, Thurder's needlegrass, Sandberg's bluegrass and cheatgrass. The northern exposures have Idaho fescue, bluegrasses, and a variety of forbs in addition to big sagebrush and juniper. The estimated successional stage of these slopes is mid-seral. The climax vegetation on the southern exposures is bluebunch wheatgrass and big sagebrush. On the north slopes, the climax vegetation is big sagebrush and Idaho fescue. Juniper may also be present in the climax community in small amounts.

A smaller community within the juniper/big sagebrush community is the riparian areas along both Home Creek and Threemile Creek. The primary vegetation along the streams is chokecherry, willow, and dogwood. The successional stage of most of the riparian community is estimated to be late seral. The climax species are not clearly known, but the aforementioned species are most likely present in the climax community.

Wildlife

The Home Creek WSA has a good population of antelope, chukar, and sage grouse. Deer use the area during the summer, but are not as abundant as in the upper elevation habitat east of the WSA. More deer move into the study area in the fall, and they winter there. Antelope summer east of Catlow Rim where there is low, open habitat.

Excellent redband trout populations occur in Threemile Creek and the lower 2 miles of Home Creek. Threemile Creek and Home Creek combined have 5 miles of trout habitat. Fencing 2 miles of Threemile Creek to exclude livestock is proposed, to increase riparian shrub density. This would reduce bank erosion and improve water quality and wildlife and fish habitat.

Excellent raptor habitat occurs along the Catlow Rim. Four prairie falcon nests and 5 golden eagle nests are usually active. This is a high nesting density for the 9 miles of rim in the WSA. Other species which may use the rim include peregrine falcons, red-tailed hawks, kestrels, great horned owls, and ravens.

Sage grouse range over the sagebrush-covered parts of the WSA. One sage grouse strutting ground exists in the area.

Nongame species include those adapted to cliffs and talus, such as bushy-tailed woodrats, canyon mouse, long-eared myotis (bat), and small-footed myotis. Other nongame species include those common to the big sagebrush, low sagebrush, and western juniper habitat. Great Basin pocket mouse, black-tailed jackrabbit, mountain cottontail, yellow pine chipmunk, yellow-bellied sapsucker, common flicker, sage thrasher, Brewer's sparrow, and western meadowlark are some of the species using these habitats.

ODFW has proposed reintroducing California bighorn sheep on Catlow Rim. Bighorns were native to most of southeastern Oregon, including the WSA.

A guzzler has been installed in the WSA. It is maintained twice a year by ODFW.

Livestock Grazing

The study area is entirely within the South Steens grazing allotment. Table 4 summarizes existing livestock use in AUMs (animal unit month, the amount of forage required by one cow and calf, or equivalent animals, for one month).

No range improvements are proposed for the WSA. However, a proposed fence in an adjacent study area (South Fork of the Donner und Blitzen, OR-2-85G) will improve the range condition and create additional forage for livestock, wild horses and wildlife through better management of the South Steens allotment (including that part of the allotment which falls within the Home Creek WSA). Existing livestock developments (among the developments discussed in the Naturalness section) include 10 reservoirs and 1 mile of fence.

The grazing operator presently uses motorized vehicles for access within and around the study area. Vehicles are used on the boundary roads and ways for salting, hauling horses and livestock supervision. The grazing operator's use of the interior ways is minimal. Horses are used to manage livestock.

Table 4. Existing Livestock Use, Home Creek WSA (OR-2-85H)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual use in WSA (AUMs)
South Steens (No. 6002)	21,835	4/16-9/30	11	2,667

Recreation Use

Recreation in Home Creek WSA is primarily oriented toward hunting. Mule deer, antelope, and chukar are the most commonly hunted game species.

Because the area is not particularly valued for hunting mule deer, current deer hunting use is low. Certain portions of the area, particularly along the eastern boundary, provide good antelope hunting. Current antelope hunting is moderate. Both deer and antelope hunters use vehicles for access. The three vehicle ways in the study area are moderately used for hunting access.

Most of the people who hunt chukars along Catlow Rim and in the canyons park on the west boundary road and walk inside the WSA. Chukar hunters account for moderate use.

Other recreational activities include fishing, backpacking, and sightseeing. Fishing use is moderate and is concentrated along Home Creek, with some use in Threemile Creek. Activities such as sightseeing account for low visitation, primarily in the canyons and along Catlow Rim.

Economic Value and Local Income

Livestock grazing, oil and gas leasing, and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were 5 oil and gas leases, and no mining claims or geothermal leases on the WSA.

Economic value and local personal income generated from existing levels of resource outputs are presented in table 5. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not

Table 5. Economic Value and Local Personal Income Generated Annually, Existing Program, Home Creek WSA (OR-2-85H) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	2,667	$20,109	$22,243
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Oil and Gas Leases	Acres	9,640	9,640	2,903
Total			29,749	25,146

significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 25,120 acres to the National Wilderness Preservation System (NWPS). Wilderness designation would protect approximately 9 miles of Catlow Rim, an 800- to 1500-foot escarpment, and the high concentration of raptor habitat along the rim and within the steep drainages of the 3 major canyons.

Wilderness designation under this alternative would maintain or improve the natural qualities of the area as well as the outstanding opportunities for solitude and recreation.

Naturalness would be enhanced by closing the 6 miles of vehicle ways. Eliminating vehicle use would allow the ways to revegetate and also improve opportunities for solitude and the quality of primitive recreation.

Designation would also preserve the special features of the WSA in their present condition. These are primarily associated with Catlow Rim, including the raptor habitat, potential bighorn sheep habitat, and areas of geologic interest.

The scenic values of the area would also be maintained by precluding major developments, including potential mineral development, within the WSA.

The **partial alternative** would add 22,135 acres to the NWPS, assuming acquisition of the 1,135 acres of private and split-estate inholdings and adjacent boundary parcels. In the area recommended suitable, it would preserve wilderness values in the same manner as the all wilderness alternative. Acquisition of the private and split-estate inholdings under this alternative would further enhance wilderness values by precluding any development associated with these parcels. Closure of 4.5 miles of ways would enhance the naturalness of the area and opportunities for solitude and primitive recreation.

In the 4,120 acres in the southeast corner and along the western boundary recommended as nonsuitable, possible mineral development could degrade the natural qualities and opportunities for solitude and primitive recreation. However,these areas do not contain any outstanding wilderness values.

Under the **no wilderness/no action alternative**, wilderness values in the entire WSA would be subject to disturbance from competing resource uses. Surface disturbing activities such as mineral development could adversely affect the naturalness of the area. Opportunities for solitude and primitive recreation could also be adversely affected by any new vehicle access resulting from development activities. Depending on the location and extent of disturbances, the special features, particularly the raptor habitat and potential bighorn sheep habitat along Catlow Rim, could be adversely affected.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development: 25,120 acres under the **all wilderness alternative** and 21,000 acres, plus an additional 1,135 acres if private and split-estate land is acquired, as proposed under the **partial alternative**.

Included in the withdrawal for the all wilderness alternative would be the 771 acres rated moderately favorable for diatomite. Under the partial alternative, 492 acres rated moderately favorable for diatomite would be withdrawn.

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness. There would be no significant impact to wildlife populations under any of the alternatives.

Improvement of riparian habitat by fencing might be appropriate in wilderness because it would correct the adverse effects of man's influence. A site-specific assessment would be prepared to determine if it conformed with Wilderness Management Policy. If the fencing is not allowed, under the **all wilderness and partial alternatives**, this opportunity to improve riparian habitat could be foregone.

The all wilderness and partial alternatives would also require that routine maintenance of a wildlife guzzler by ODFW be done on foot or by horseback. Due to its location near a boundary road, this should not be a problem.

The **no wilderness/no action alternative** would allow fencing in Threemile Creek to exclude livestock. Water quality and wildlife and fisheries habitat would be improved.

Effects on Livestock Grazing

Under the **all wilderness and partial alternatives**, vehicle access for livestock management would be precluded, unless there were no practical alternatives to using vehicles.

Under the **no wilderness/no action alternative**, there would be no restrictions on vehicle use.

Effects on Recreation Use

The quality of and opportunities for primitive recreation in the study area would be maintained or improved under the **all wilderness and partial alternatives**. Opportunities for primitive recreation such as day hiking, backpacking, and viewing of wildlife along Catlow Rim and in the canyons would be enhanced by closure of the vehicle ways.

Most deer and antelope hunters use the ways for vehicle access into the WSA. The elimination of such access would lead to a reduction in hunting use. This does not mean that hunting in the area would be eliminated. Some of the reduction in visitor days from vehicle-oriented hunting would be offset by increased use from hunters who do not use vehicles as transportation within the study area.

Other than fishermen who hike into the canyons, and chukar hunters who use the area along the rim, few people who visit the area engage in primitive recreation. Such use of the area probably would not substantially increase. Any increase in primitive recreation under the all wilderness and partial alternatives, would not be sufficient to offset the reduction in vehicle-oriented recreation. There would be a net reduction in overall recreation use under the all wilderness and partial alternatives.

Under the **no wilderness/no action alternative**, primitive recreation would be subject to continued disturbance by motor vehicles, but the encounters would be infrequent because primitive recreation use would occur primarily along Catlow Rim and in the three major canyons, all of which are inaccessible to vehicles. Overall recreation use would not be significantly affected.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 6 and 7. Table 6 shows the effects on economic value and table 7, the effects on local personal income.

Currently, there is little dependence on vehicles for livestock management in the study area. The all wilderness and partial alternatives would restrict such vehicle use unless there were no practical alternative. The maximum impact from vehicle restrictions on the grazing operator in the WSA would be an increase in cost of about $43 per year.

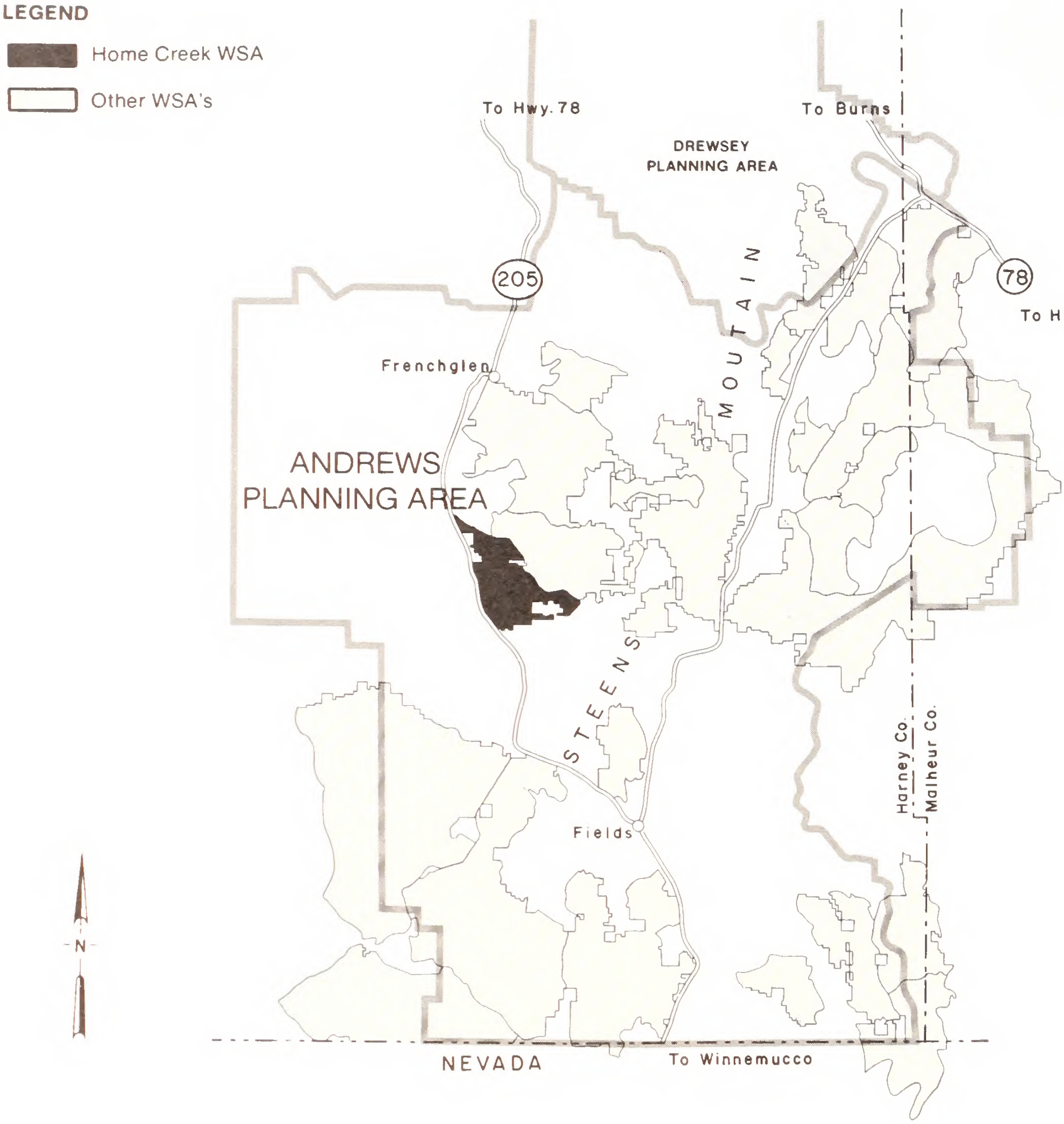
Table 6. Effects of Alternatives on Annual Economic Value, Home Creek WSA (OR-2-85H) (1981 price levels)

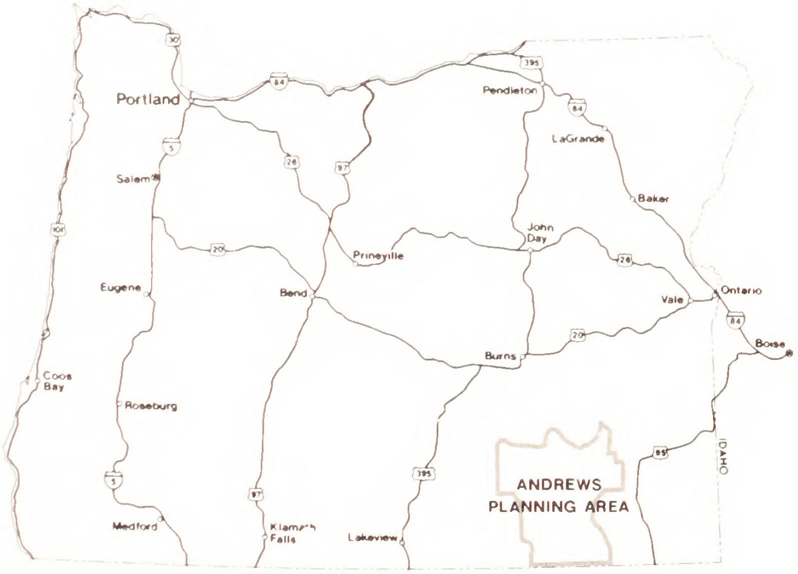
Item	Unit of Measure	All Wilderness	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Oil and Gas Leases	Acres	-9,640	-6,370	0
VALUE OF EXPECTED CHANGES IN OUTPUTS				
Reduced Access [1]	$	-43	-29	0
Oil and Gas Leases	$	-9,640	-6,370	0
Total	$	-9,683	-6,399	0

[1] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 7. Effects of Alternatives on Local Personal Income, Home Creek WSA (OR-2-85H) (1981 price levels)

Item	Unit of Measure	All Wilderness	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS				
Oil and Gas Leases	Acres	-9,640	-6,370	0
INCOME FROM EXPECTED OUTPUT CHANGES				
Oil and Gas Leases	$	-2,903	-1,917	0





U. S. Department of the Interior
Bureau of Land Management

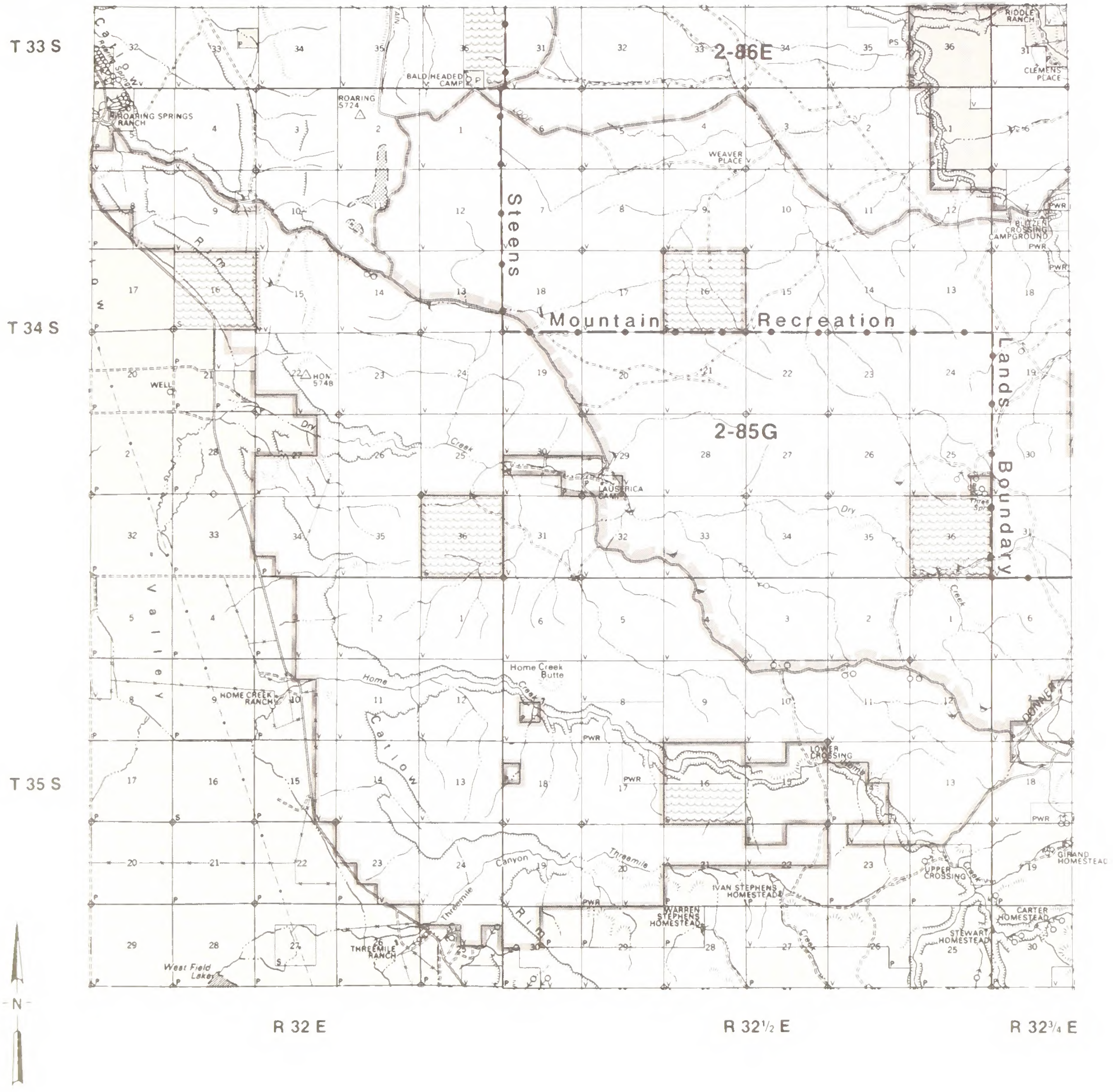
Burns District

Home Creek WSA
OR-2-85H

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

Wilderness Study Area Boundary

Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

☐ Private

▨ BLM Surface-State or Private Subsurface (Split Estate)

U. S. Department of the Interior
Bureau of Land Management

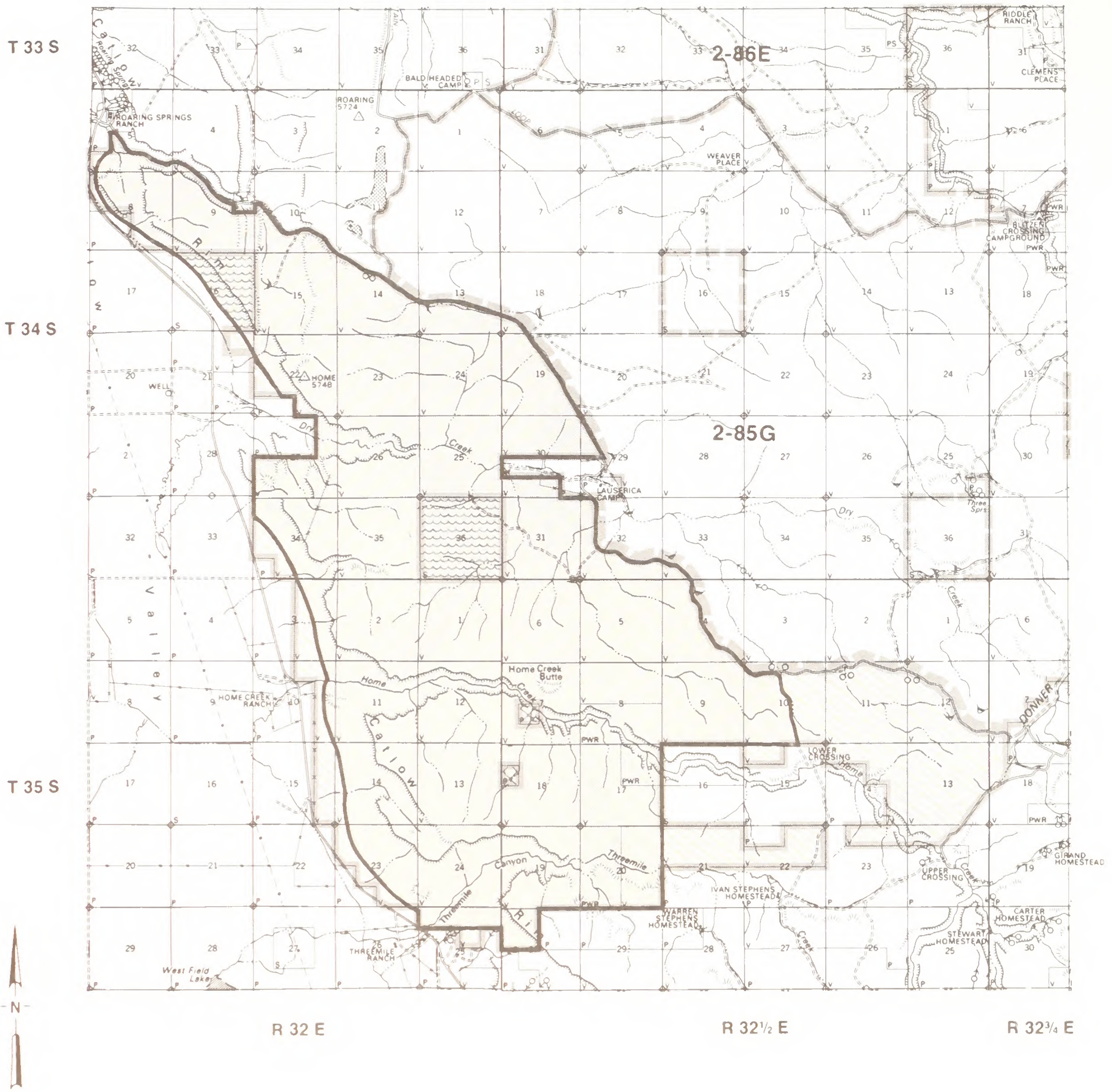
Burns District

Home Creek WSA
OR-2-85H

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

▬ Wilderness Study Area Boundary

- - Boundary of Adjacent Wilderness Study Areas

☐ Recommended Suitable for Wilderness

☐ Recommended Non-suitable for Wilderness

▨ Non-Federal Land within Recommended Wilderness

▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

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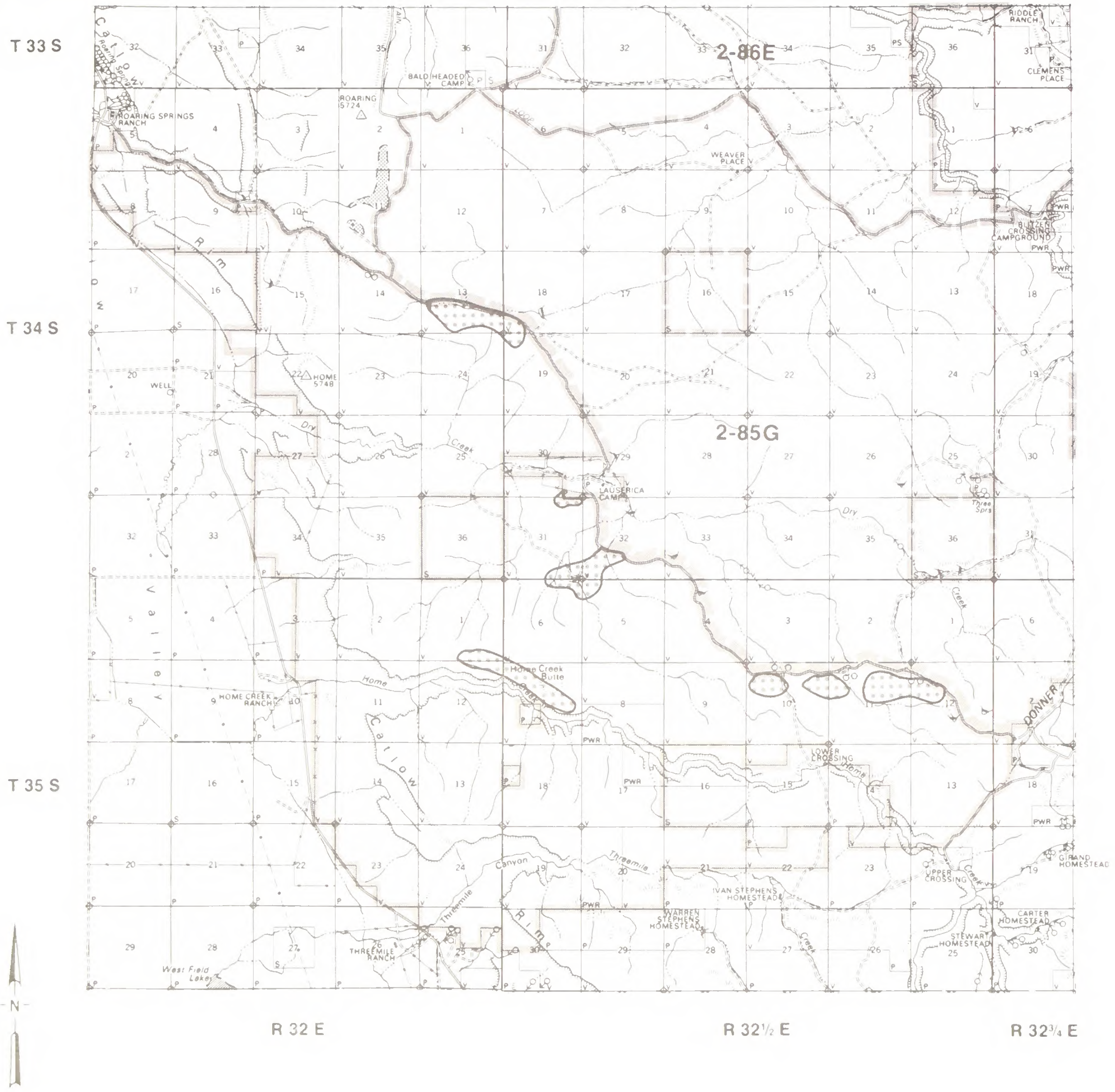
Burns District

Home Creek WSA
OR-2-85H

PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 3



▨ **Medium Potential (3C) for Diatomite**

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Burns District

Home Creek WSA
OR-2-85H

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

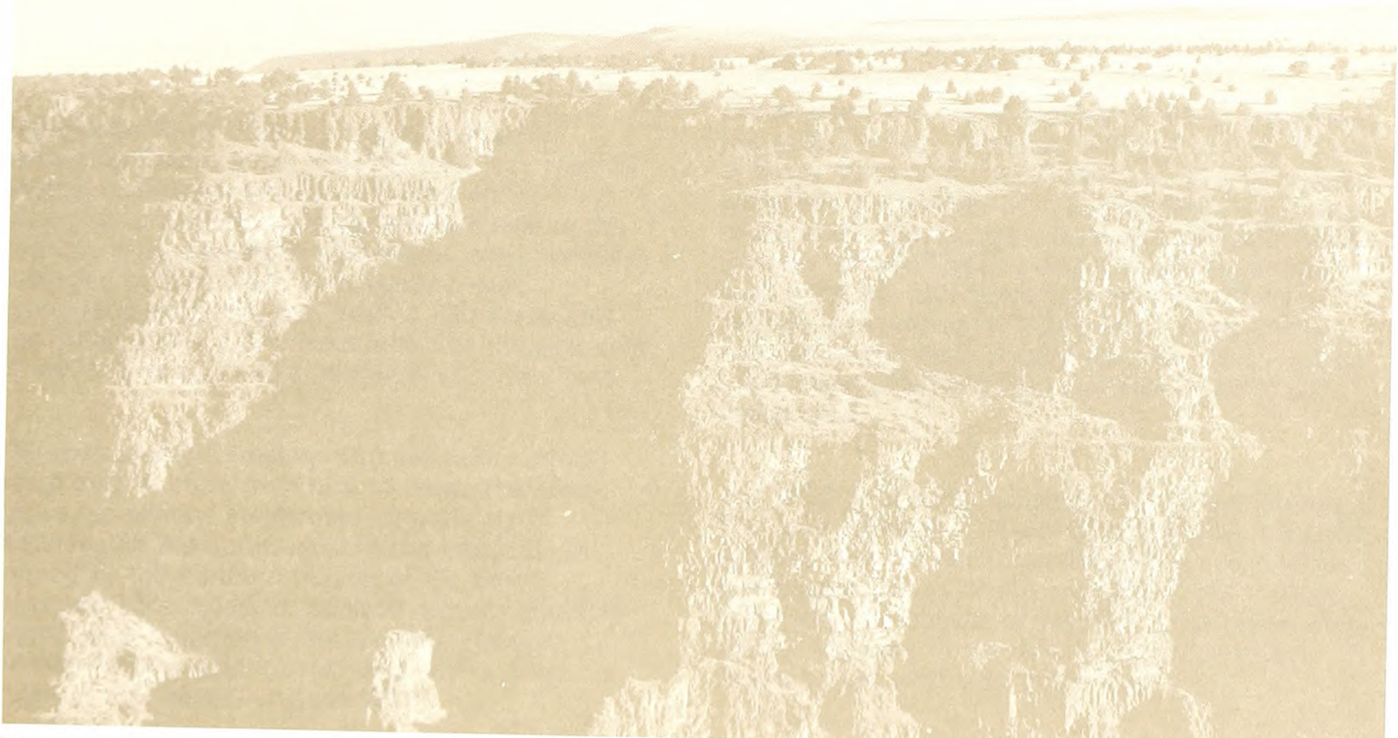
1 0 1 2 MILES

MAP 4

Home Creek WSA, OR-2-85H. The mouth of Home Creek Canyon looking east from the western boundary. The area suitable under the partial (preferred) alternative begins at the base of the rim. The rugged canyon walls rise 1400 feet from this point along the western boundary, and provide high quality habitat for a variety of raptor species. June 1983.

Home Creek WSA, OR-2-85H. This view from the northeastern boundary, looking southwest, shows the relative flatness of this part of the study area. Home Creek Butte and Home Creek Canyon are visible on the horizon on the left, while Dry Creek Canyon can be seen on the right. All of the area shown is suitable under the partial (preferred) alternative. The eastern three-quarters of the WSA is a gently rolling plateau. September 1983.

Home Creek WSA, OR-2-85H. This is a view of Home Creek Canyon looking west nearly three miles into the study area near Home Creek Butte. Everything in this view is within the suitable area under the partial (preferred) alternative. The juniper and sagebrush vegetation in combination with the topographic diversity and scenic quality of the area enhance the opportunities for solitude and recreation. September 1983.



Home Creek WSA, OR-2-85H. Looking north from the south side of Home Creek Canyon. Within the area suitable under the partial (preferred) alternative. This view shows the basalt layers which form the Steens Mountain fault block, and the plateau east of the Catlow Rim. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Blitzen River Wilderness Study Area (OR-2-86E)

General Description of the Study Area

The Blitzen River wilderness study area (WSA) is located 60 miles south of Burns (less than one mile south of Frenchglen) in Harney County (see map 1). The WSA is adjacent to State Highway 205.

The Blitzen River WSA is irregularly shaped, containing 51,890 acres of public land (see map 2). Several inholdings are also included within the study area's boundary. On the western side of the river are three parcels of split-estate land (federally managed surface, state or privately owned subsurface mineral rights) totaling 680 acres and one 40-acre parcel of private land. On the east side of the WSA is one 640-acre parcel of private land.

The area is approximately 12 miles from north to south and 15 miles from east to west. The study area's boundaries are formed by a variety of features. On the north, most of the boundary is formed by the northern portion of the Steens Mountain Loop Road. In addition, private and split-estate land, a portion of the Malheur National Wildlife Refuge, and a small segment of State Highway 205 also bound the WSA.

Most of the eastern boundary lies adjacent to private land. Small sections of road, which generally serve private landowners, also form part of the eastern boundary. On the south, the southern portion of the Steens Mountain Loop Road and several other BLM roads make up the boundary, along with several parcels of private and split-estate land. The western boundary generally follows a powerline, although a parcel of private land also occurs on this side of the area.

Seven dead-end roads, totaling 14 miles, penetrate the area and also form part of the boundary. Three of these roads enter the study area from the north, while two roads enter from the southwest and two roads enter from the southeast. Two of these roads (one on the southwest and one on the southeast) lead to private and split-estate parcels. Although virtually surrounded by public land, these parcels are part of the study area's boundary. They include 1,320 acres of private land and 480 acres of split-estate land.

The WSA is a rolling, sloping, high desert plateau. The area contains a variety of topographic features ranging from the dominant features of the Donner und Blitzen River Canyon and Fish Creek Canyon, to the sloping foothills of the Steens Mountain ridge east of the river, to the deeply cut rock-rimmed ridges on the west side of the river.

One of the main features of the study area, the Donner und Blitzen River, winds its way through the WSA from south to north for approximately 15 miles and divides the area in half. At one point, the western wall of the canyon rises 600 feet above the river; however, the normal depth of the rocky canyon is 300 to 400 feet. The study area reaches its lowest elevation, 4,240 feet, at the mouth of the Blitzen River Canyon on the northern edge of the WSA. At its widest point, this canyon is a half mile wide, although the average width is about a quarter mile.

Fish Creek, like the Blitzen, is also a perennial stream which drains the higher elevations of the Steens. Fish Creek is located on the eastern side of the river and flows about six miles to the west until it intersects the Blitzen in the north-central portion of the WSA. Fish Creek also flows through a steep-walled canyon which ranges in depth from about 200 feet where the drainage enters the WSA on the eastern boundary to 400 feet where the creek merges with the Blitzen. Fish Creek also averages a narrow quarter mile in width.

On the east side of the river, the topography of the study area is gently rolling and sloping, as it includes the upper-elevation western foothills of Steens Mountain. It is near the eastern boundary that the WSA reaches its highest elevation of nearly 7,400 feet. To the west of a ridgeline which parallels the western side of the Blitzen River, the terrain is flatter and more open.

The study area contains a variety of vegetation including mountain mahogany and numerous riparian species in the canyons, and, on the flatter terrain and foothills, big sagebrush and low sagebrush. Scattered patches of juniper occur throughout the WSA, but the junipers are concentrated within the central and northeastern portions of the area. Large aspen groves occur at the higher elevations in the eastern portion of the WSA.

Interrelationships

Adjacent to the Blitzen River WSA on the north, east and south are three other study areas. All three are separated from the Blitzen River WSA by roads. On the east, a road which serves as access to private lands separates the study area from the Little Blitzen Gorge WSA (OR-2-86F). The northern portion of the Steens Mountain Loop Road divides the study area from the Bridge Creek WSA (OR-2-87) to the north, while the southern portion of the Loop Road forms the boundary between the Blitzen River WSA and the South Fork of the Donner und Blitzen River study area (OR-2-85G) to the south. Both sections of the loop road have been constructed and maintained by BLM. The roads are heavily used by livestock permittees for access to summer range, by BLM employees for administrative purposes, and by recreationists for access to the upper elevations of Steens Mountain.

Most of the Blitzen River WSA is included within an area designated by BLM as the Steens Mountain Recreation Lands. The recreation lands were established in 1971 with the cooperation of local groups and government entities, as well as private landowners. The designation was designed to maintain a multiple-use-management concept while protecting the existing natural condition of the mountain.

A portion of the Desert Trail is planned to cross the Blitzen River WSA. Although the specific route has yet to be determined, the planning effort is underway. BLM and the Desert Trail Association have joined in a cooperative management agreement to share responsibilities for developing and maintaining the trail. The Desert Trail is a component of the Oregon State Recreational Trails System.

The Oregon Department of Fish and Wildlife (ODFW) conducts an aerial census of wintering deer herds and summer antelope use in this and adjacent areas.

BLM, in conjunction with ODFW, conducts fish studies on the Blitzen River within the study area. The purpose of these studies is to assess and monitor aquatic habitat through fish populations. Helicopters are the primary means of access to these streams, but vehicles are also used.

A portion of the WSA including all of the public land along the Blitzen River south of Fish Creek is in a power site reserve which earmarks the land for potential water power and water storage development. The ‘withdrawal‘ is scheduled for review in the next few years, which may lead to its revocation. Power site development is not foreseen and therefore not discussed further.

The southwest part of the WSA is in the South Steens wild horse herd management area (HMA). HMA management will not be significantly affected by any of the alternatives.

Issues

Issues relating to each WSA were raised by BLM

and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- potential increased recreation use (because of wilderness designation) and its effects on the area's wilderness values and other features (BLM's wilderness management policy states that recreation use would be managed to protect the area's wilderness values),
- development of proposed livestock and wildlife improvements,
- management of wild horses in the area (see the Statewide EIS volume),
- restrictions on vehicle access and other limitations, if designated wilderness, and effects on fish populations in Donner und Blitzen River and Fish Creek, the area's big game populations, and opportunities to improve wildlife habitat,
- closing the entire area to vehicle use, if designated wilderness, and effects of such closure on other types of recreation and other multiple uses in the area, and
- effects of wilderness designation on the existing designation of the area as part of the Steens Mountain Recreation Lands (the designation would not be affected, but the management plan for the recreation lands would need revision).

Also raised as issues were: the possibility of combining this study area with other adjacent WSAs in the Steens Mountain area to form a single, larger wilderness area; and whether the area is manageable as wilderness given its configuration.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- enhanced wilderness
- preferred alternative
- partial
- no wilderness/no action

The possibility of combining the Blitzen River WSA with the three adjacent study areas is not analyzed under the enhanced wilderness alternative. The boundary roads on the north and south, which separate the Blitzen River WSA from two other study areas, are important access routes on Steens Mountain, providing access to recreationists, private landowners, livestock operators, and BLM personnel, and closing them is not considered feasible.

The merger of the Blitzen River area with the Little Blitzen Gorge WSA (OR-2-86F) to the east is not analyzed because the road which separates these two areas provides access to private property. In addition, the portion of adjacent boundary between the two study areas is relatively small (about one mile) and is divided by a parcel of private land. Also, combining the areas would not substantially enhance manageability or wilderness values of either of the WSAs, because the adjacent portion of boundary is away from the anticipated areas of primary recreation use of both study areas.

All Wilderness

The all wilderness alternative would recommend all 51,890 acres of public land in the Blitzen River WSA suitable for wilderness designation (see map 2). For purposes of analysis, it is assumed that none of the split-estate or private lands within the study area would be acquired and that the 7 dead-end roads which enter the WSA would remain open.

Enhanced Wilderness

Under the enhanced wilderness alternative, all 51,890 acres of public land in the Blitzen River WSA and 200 acres of public land outside of the WSA on the eastern side would be recommended as suitable for wilderness (see map 3). In addition, an attempt would be made to acquire 6,660 acres of split-estate and private inholdings and adjacent land. These parcels (4,660 acres of private land and 2,000 acres of split-estate land) could be acquired through purchase or exchange with willing landowners. The acquisitions would result in boundary adjustments on the southeast, west, and northern boundaries.

Some 14 miles of dead-end roads which enter the WSA would be closed under this alternative.

Assuming acquisition of the private and split-estate lands and addition of the public land, total area recommended suitable under this alternative would be 58,750 acres.

This alternative would improve manageability of the study area by precluding the possibility that the private or split-estate land would be used or developed in ways that would be incompatible with preservation of wilderness values on surrounding lands. It would eliminate the potential problem of visitors crossing private lands. In addition, the road closures would improve opportunities for solitude and primitive recreation by eliminating or substantially reducing vehicle use in the area.

Preferred Alternative

The preferred alternative would recommend 20,170 acres of public land suitable for wilderness (see map 4). The remaining 31,720 acres of the study area would be recommended as nonsuitable. The alternative recommends that all or part of 4 roads (2 on the northeast, 1 on the southeast, and 1 on the west) be closed to vehicle use. Also under this alternative, an attempt would be made to acquire 1,360 acres of split-estate and private land, within and adjacent to the WSA, through purchase or exchange with willing land owners. The acquisitions would include approximately 1,120 acres of split-estate land in two parcels and 240 acres of private land in three parcels.

Assuming acquisition of these parcels, total area recommended suitable under this alternative would be 21,530 acres.

Several boundary adjustments would be made under this alternative. While the northeastern boundary would remain the same, basically following the Steens Mountain Loop Road, the remainder of the WSA boundary would be substantially altered.

Most of the public land recommended as nonsuitable under the preferred alternative lies to the west of the Donner und Blitzen River Canyon. The preferred boundary on the west would begin just west of the Page Springs Campground on the northern side of the area. The boundary would follow 4 miles of dead-end road which parallel the western rim of the river canyon. At the end of the road, the boundary would turn west along a small drainage until it reached the 5200-foot elevation contour (about 1/2 mile). Most of the remainder of the boundary would follow this contour until it merged with the top of the rim on the western side of the canyon, where it would follow the rim until it reached the private land on the southern end of the WSA.

Some 24,890 acres on the western side of the WSA that would be recommended nonsuitable include a number of vehicle ways (a vehicle route established and maintained solely by the passage of motor vehicles) and reservoirs.

The preferred alternative would also recommend major boundary adjustments on the southeast. After following private land on the south, where the Blitzen River enters the study area, the boundary would then go north along a way and a road until it intersected a large private parcel on the boundary. Following legal subdivisions, the boundary would skirt this parcel of private land (and some public land) until it reached the southern rim of Fish Creek Canyon.

Within this portion of the preferred boundary, 1 dead-end road, about 1 mile in length, would be closed and an attempt made to acquire a 40-acre parcel of private land along the east side of the river. The remainder of the southeastern boundary would follow the southern rim of the canyon (crossing private land in two locations) east to where Fish Creek enters the study area along the existing WSA boundary. Some 6,830 acres of public land on the southeastern side of the WSA would be recommended as nonsuitable for wilderness. This would avoid potential manageability problems with the private lands on this side of the area and would generally provide a more identifiable boundary along roads, ways, and rims.

The land uses expected within the portions of the WSA not recommended as suitable include continued use of the area for livestock grazing, development of range improvements for grazing, and possible mineral exploration and development. The seasonal restrictions on the use of vehicles and the closure of selected vehicle ways as designated by the Steens Mountain Recreation Plan would continue.

Partial

The partial alternative recommends 7,770 acres of public land suitable for wilderness and 44,120 acres of public land nonsuitable (see map 5). Under this alternative a portion (about 1/2 mile) of a road which enters the WSA from the west would be closed. In addition, an attempt would be made to acquire two parcels of split-estate land totaling 620 acres and two parcels of private land totaling 200 acres.

Assuming acquisition of these parcels, total area recommended suitable would be 8,590 acres.

Substantial boundary adjustments would be recommended under this alternative. The partial alternative primarily recommends that only the central core of the WSA, the Blitzen River and Fish Creek Canyons, be designated as wilderness.

The boundary recommendation on the western side of the WSA is the same as that described in the preferred alternative, following a road, a contour line, and the rim of the Blitzen River Canyon. On the southeastern side of the WSA, the boundary would follow the eastern rim of the Blitzen River Canyon and the southern rim of Fish Creek Canyon. On the eastern side of the study area, where Fish Creek enters the WSA, the boundary would follow the legal subdivision between public and private land.

Much of the northeastern corner of the WSA would also be excluded from the wilderness under this alternative. The boundary on this side of the study area would follow the northern rim of Fish Creek Canyon for over 4 miles, then north along a legal subdivision (less than 1/2 mile) until it intersected one of the dead-end roads which enters this portion of the study area. The boundary would then follow this road until it reached the existing boundary on the North Loop Road.

In recommending only the core of the area suitable for wilderness, the partial alternative would minimize the potential manageability problems associated with private and split-estate lands and reduce the conflicts with proposed range improvement projects. In addition, the alternative would substantially reduce the effect of numerous ways and reservoirs on a visitor's perception of naturalness and solitude.

Under this alternative, the lands recommended as nonsuitable for wilderness would continue to be managed primarily for livestock grazing, and would be subject to construction of range improvements or potential mineral exploration and development. Vehicle use restrictions under the Steens Mountain Recreation Plan would remain in effect.

No Wilderness/No Action

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- construction of proposed livestock and wildlife improvement projects, including spring developments, reservoirs, and fences;
- continued use of vehicles for livestock management and recreational purposes, except that access into the area for fishing and hunting would be restricted as specified in the Steens Mountain Recreation Plan (At this time, all or part of several ways on the eastern side of the area are closed to vehicle use, and the entire study area is within an area of seasonal road closures.); and
- continued availability for mineral exploration and development.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The Blitzen River WSA would be manageable as wilderness under the all wilderness alternative. Manageability problems could occur in the area, however, primarily because of private inholdings and boundary locations. Manageability problems could also result from continued vehicle use on seven dead-end roads which would remain open under this alternative.

The private and split-estate inholdings, as well as the boundary parcels which are nearly surrounded by public land, could present manageability problems if developed. Though there are no known plans for development at this time, all of these lands are within an area of moderate favorability for the occurrence of metals. Development of the mineral resources of these parcels would be difficult for BLM to control. Developments and the potential for increased access could have an adverse effect on the area's wilderness values.

The location of the private land within and adjacent to the study area could also result in manageability problems with respect to recreation use. Most of these lands are not fenced or otherwise marked to

Table 1. Summary of Proposed Management Under Each Alternative, Blitzen River WSA (OR-2-86E)

Proposed Management	All Wilderness	Enhanced Wilderness	Preferred	Partial	No Wilderness/ No Action
Acres Designated as Wilderness	51,890	52,090	20,170	7,770	0
Acres Closed to ORVs by Wilderness Designation	51,890	52,090	20,170	7,770	0
Miles of Roads Closed	0	14	6.5	0.5	0
Miles of Ways Closed	56	56	8	1	0
Acres of Full Fee Estate Acquired [1]	0	4,660	240	200	0
Acres of Split Estate Acquired [1]	0	2,000	1,120	620	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	51,890	52,090	20,170	7,770	0
Structural Wildlife Projects Developed:					
Fences (miles)	0-1.9	0-1.9	0-1.9	0-1.9	1.9
Reservoir Reconstruction and Stocking Project (number)	0	0	1	1	1
Structural Livestock Projects Developed:					
Reservoirs and Waterholes (number)	0-6	0-6	1-6	4-6	6
Springs (number)	0-3	0-3	1-3	3	3
Fences (miles)	0-2	0-2	2	2	2

[1] Upon acquisition, these additional lands would be incorporated into the wilderness area, closed to vehicle use, and withdrawn from mineral location and leasing.

indicate private ownership, making management difficult in some of the WSA, particularly within the drainages and portions of the eastern boundary where recreation use could occur.

Under the enhanced wilderness alternative the manageability of the area would be improved with acquisition of the inholdings and some lands along the boundary. Boundary identification problems could still occur along the extreme eastern side of the area, but those problems could be lessened with signing or fencing.

The acquisition of split-estate or private inholdings and boundary parcels would eliminate the possibility that these lands being developed or used in ways that would be incompatible with wilderness management. Land acquisition should also eliminate the need for access to these parcels.

The area would also be manageable as wilderness under the preferred and partial alternatives. Most of the inholdings and boundary parcels fall within the areas recommended as nonsuitable for wilderness. Acquisitions would eliminate problems with the private and split-estate parcels which fall within the Fish Creek drainage. Some manageability problems could occur where the canyons cross the study area boundary to private land along the perimeter of the WSA. These problems could be reduced with signing or other visitor information methods.

Rationale for Selection of the Preferred Alternative

The area recommended as suitable for wilderness under the preferred alternative includes the canyons of both Fish Creek and the Donner und Blitzen River. In addition the area contains some of the rolling hills east of the river including an area with relatively dense juniper cover in the northeastern corner of the WSA. The area recommended for wilderness is basically natural. It has outstanding opportunities for solitude and a variety of primitive types of recreation. Wildlife habitat and scenery of the suitable portion are special wilderness features.

This alternative would protect the area's wilderness values (naturalness, solitude, and recreation) and special features, within an area capable of being managed to preserve these qualities.

Conflicts with other resources are relatively minor within the suitable portion of the study area. The suitable area does have moderate favorability for the occurrence of metals and several range improvements (fences, reservoirs, and spring developments) have been proposed for the northern portion of the area. However, these conflicts are not sufficient to outweigh the value of this area as wilderness.

Table 2. Summary of Environmental Consequences of Alternatives, Blitzen River WSA (OR-2-86E)

Resource or Activity	All Wilderness	Enhanced Wilderness	Preferred Alternative	Partial	No Wilderness/No Action
Wilderness Values	Would add 51,890 acres to the NWPS. Would preserve the area's wilderness values and special features, including portions of the Blitzen River and Fish Creek and their associated outstanding scenic values, as well as raptor habitat crucial deer winter range, sage grouse strutting ground, and wild horse herds. Closure of 56 miles of ways would enhance wilderness values. Development of, or activities on, the inholdings could adversely affect wilderness values. Although minor manageability problems could occur due to private and split-estate inholdings and dead-end roads, the area is manageable as wilderness.	Would add 58,750 acres to the NWPS, assuming acquisition of 6,660 acres of private and split-estate land and addition of 200 acres of public land. Includes all of the features identified under the all wilderness alternative. Improves the manageability of the area over the all wilderness alternative by road closures and acquisitions.	Would add 21,530 acres to the NWPS, assuming acquisition of 1,360 acres of private and split-estate land. The area recommended as suitable includes the Blitzen River Canyon and Fish Creek Canyon and the special features except the wild horse herd. Would maintain these values at their present or an improved level. The area recommended as suitable is manageable as wilderness. 31,720 acres recommended as nonsuitable for wilderness, primarily on the western and southeastern sides of the study area, would be open to exploration and development of mineral resources as well as livestock and wildlife improvements, all of which could adversely affect wilderness values.	Would add 8,590 acres to the NWPS, assuming acquisition of 820 acres of private and split-estate land. Includes the canyons of Fish Creek and the Blitzen River and the scenic values and raptor habitat identified as special features. Wilderness values of the area would be maintained or improved. Area is manageable as wilderness. Wilderness values on 44,120 acres recommended as nonsuitable, including most of the crucial deer winter range, and the sage grouse strutting ground, would be adversely affected in the same manner as for the preferred alternative.	Wilderness values and special features would be subject to disturbance from potential mineral development, and livestock and wildlife improvements.
Energy and Mineral Development	Development precluded on 51,890 acres, including 250 acres with high potential for metals, and 51,640 acres with moderate potential for metals.	Development precluded on 52,090 acres of public land, including 200 acres additional public land, plus an additional 6,660 acres if private and split-estate land is acquired. 250 acres with high potential for metals and 51,840 acres with moderate potential for metals.	Development precluded on 20,170 acres, plus an additional 1,360 acres if private and split-estate land is acquired. Includes 20,170 acres with moderate potential for metals and none of the area with high potential for metals.	Development precluded on 7,770 acres, plus an additional 820 acres if private and split-estate land is acquired. Includes 7,770 acres with moderate potential for metals and none of the area with high potential for metals.	No impact.
Wildlife	Wildlife habitat preserved. Opportunity to improve riparian habitat by fencing Fish Creek and opportunity to reconstruct Kundert Reservoir might be foregone. Small increase in wildlife and fish populations due to wildlife and range projects might be foregone.	Same as all wilderness.	Wildlife habitat preserved in suitable area. Opportunity to improve riparian, aquatic habitat through fencing on Fish Creek might be foregone. Small increase in fish and wildlife populations might be foregone if fencing and selected range projects are not developed. Reservoir reconstruction project would provide for fish stocking.	Same as preferred.	No impact. Small increase in fish and wildlife populations may be realized from the development of range and wildlife projects.
Livestock Grazing	If proposed projects are not allowed improved management opportunities, protection of springs and increased forage in WSA foregone. The potential to increased licensed use by up to 1,737 AUMs would also be foregone. Closure of ways would inconvenience livestock operators.	Same as all wilderness alternative, except, the closure of the dead-end roads as well as ways would greatly inconvenience livestock operators.	Five reservoirs, two spring developments and associated increase in available forage in WSA might be foregone. A potential increase of 500 AUMs in licensed use might be foregone.	Two reservoirs and the associated increase in available forage might be foregone. A potential increase of 150 AUMs in licensed use might be foregone.	Projects would provide additional forage. Possible increases in licensed use of up to 1,737 AUMs.

Table 2. (continued)

Resource or Activity	All Wilderness	Enhanced Wilderness	Preferred Alternative	Partial	No Wilderness/No Action
Recreation Use	Use of motor vehicles for recreation would be restricted to dead-end roads. Wildlife population increases resulting in possible recreation increases would not significantly increase overall recreation use. A slight reduction in overall recreation use may result as primitive recreation may not increase enough to offset vehicle-oriented losses.	Vehicle-oriented recreation eliminated within WSA. Wildlife population increases resulting in possible recreation increases would not significantly increase overall recreation use. There would be a net reduction in overall recreation use as the increase in primitive recreation use would not be sufficient to offset losses.	No significant change in visitor use as a result of road and way closures. Quality of primitive recreation subject to adverse impacts in area recommended as nonsuitable. Wildlife population increases resulting in possible recreation increases would not significantly increase overall recreation use. Overall recreation use of area would increase.	Same as preferred alternative.	Primitive recreation would remain subordinate to vehicle-oriented recreation. Wildlife population increases resulting in possible recreation increases would not significantly increase overall recreation use. No significant impact.
Economic Value and Local Income	Decrease in economic value of $761 and no change in local personal income if projects are not allowed. Increase in economic value and local personal income by $12,022 and $17,663, respectively, if projects are allowed. The maximum increase in transportation costs to ranchers with grazing permits would be $761.	Same as all wilderness.	Increase in economic value and local personal income by $9,687 and $12,198 respectively, from construction of proposed projects outside suitable area. Increase in economic value and local personal income by $12,783 and $17,663 respectively, if proposed projects are allowed.	Increase in economic value and local personal income by $10,583 and $15,360 respectively, from construction of proposed projects outside suitable area. Increase in economic value and local personal income by $12,783 and $17,663, respectively, if proposed projects are allowed.	Increase in economic value and local personal income by $12,783 and $17,663, respectively, from construction of proposed projects.

Portions of the Blitzen River area recommended nonsuitable under the preferred alternative include most of the land on the western side of the river and much of the area in the southeastern corner.

On the western side of the study area, much of the land recommended as nonsuitable has a greater concentration of range developments than the remainder of the WSA. This concentration has an adverse effect on naturalness in this part of the study area. In addition, the opportunities for solitude within this area of concentrated developments would be further lessened by maintenance and livestock management activities at and around the developments.

The southwestern corner of the study area, while it has few range improvements, has a limited number of wilderness qualities. This portion of the WSA has some opportunity for solitude but no outstanding recreational values. This area would not provide any significant contributions to the value of the area as wilderness and would be better suited to current uses and activities of the area than it would be as wilderness.

The southeastern portion of the area is not recommended as suitable for wilderness because of the potential manageability problems with private land inholdings and boundary parcels. Avoiding these potential management problems would require acquisitions of a large amount of private land. Although this part of the study area has opportunities for solitude and recreation, wilderness values are not sufficient to warrant the acquisition of the private lands.

Affected Environment

This section discusses only those activities or resources which influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The study area appears to be in a basically natural condition. The man-made features within the boundaries and those which affect the area from outside the WSA do not have an overwhelming influence on the naturalness of the WSA.

The study area contains 79 man-made features: 49 water developments, including 1 developed spring, 1 irrigation ditch (2 miles in length) and 47 reservoirs; 12 fences totaling about 32 miles; and 18 vehicle ways totaling about 56 miles.

It is estimated that approximately 7 percent of the study area is influenced by these features. (The area of influence is an estimate of the acreage within the WSA from which these man-made features can be seen.)

On the west side of the river, there are 19 water developments, including the irrigation ditch. The reservoirs are fairly large and have a much greater influence than developments on the east side of the river. On the west side of the study area, the drainages flow through fairly wide valleys bounded by plateaus. The developments often occur in these drainages and are quite visible from most of the higher elevations which surround them.

There are 30 water developments including one spring on the east side of the river. However, the increased amount of vegetative screening (juniper), the small size of most of these developments, and the location of many of the reservoirs high on gentle sideslopes reduces the visual influence of the developments.

Vehicle ways within the WSA also have a stronger influence on the naturalness of the west side of the river than they do on the eastern side. This is partly because 38 of the 56 miles of ways are on the western side of the area, but topography is also a factor. The ways on the west side of the river are in the broad valleys of the drainages, and because most of these drainages are between higher plateaus and ridges, the vehicle tracks are visible from a much greater distance. The ways on the east side are located in shallow drainages or on the crest of a ridge. In addition, juniper screens more of the developments on the east side than it does on the west.

Although the fences are somewhat more concentrated on the west side of the WSA, they are generally screened by vegetation or topography and do not have a substantial visual influence on any particular portion of the WSA.

Outside developments influencing naturalness of the study area are few. These developments include four small reservoirs along the western boundary, the roads which surround most of the WSA, and a powerline which forms part of the northwestern boundary. The powerline has the greatest influence on naturalness in the study area, as it is visible from a number of areas on the northwest side of the WSA.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude within the study area are outstanding. The area contains a substantial amount of topographic and vegetative screening. The Blitzen River and Fish Creek Canyons, along with junipers and aspen groves, enhance the opportunity for a visitor to find a secluded spot. There are small portions of the WSA, mostly near the western boundary, where finding seclusion would be difficult because of a lack of topographic or vegetative screening.

Opportunities for primitive recreation are outstanding within the WSA, including day hiking, camping, backpacking, horseback riding, hunting, fishing, observing wildlife, sightseeing, and photography.

Opportunities for day hiking are outstanding. It is likely that the bulk of the use would originate from the Page Springs campground area (outside the WSA along the northern boundary) and be concentrated in the northern portions of the Blitzen River Canyon. The high canyon walls and perennial stream of the Blitzen River Canyon offer an enjoyable and relatively easy hike. Several small, steep, side drainages provide challenging opportunities for leaving the canyon and returning via a different route.

Primary attractions for backpacking and camping are likely to be the drainages of the Blitzen River and Fish Creek. The steepness of the canyons provide a challenge for visitors trying to leave or enter the canyons from the side drainages. Additionally, the water and riparian vegetation create an enjoyable atmosphere for hiking. The gentleness of the terrain and the presence of vegetative cover provide excellent opportunities for visitors to find suitable places for camping. The availability of water within this area is limited, the only dependable sources being Fish Creek and the Donner und Blitzen River.

There are also outstanding opportunities for horseback riding. The gentleness of most of the terrain would provide relatively easy access to the majority of the WSA.

Opportunities for hunting, especially mule deer, are considered excellent. The WSA is located within the summer ranges of deer and antelope. There are also opportunities for hunting chukar, and there are good populations of sage grouse in the WSA, but the opportunities for hunting sage grouse are limited by ODFW regulation.

Opportunities for fishing on the Donner und Blitzen River and Fish Creek are outstanding. The river and its upstream tributaries are managed entirely for wild trout. This area is attractive to anglers due to its remoteness and excellent angling for large trout.

Opportunities for sightseeing, photography, and observing wildlife are also good within the WSA.

Special Features

Features in the Blitzen River WSA which add to the value of this area as wilderness include scenic quality and wildlife.

The area's scenery is outstanding, particularly in the Blitzen River and Fish Creek Canyons, and in the aspen groves and meadows on the east side of the area. The topography of the WSA, with the steep rugged canyons and adjacent ridgelines covered by a combination of juniper and sagebrush intermixed with outcroppings of dark basalt rock, offer spectacular scenery.

Special wildlife features found in the study area include a sage grouse strutting ground, crucial deer winter range, redband trout, and a raptor nesting area.

The sage grouse strutting ground is located near the northern boundary. This is an area where the sage grouse conduct an extensive courtship dance prior to mating. The same area is often used year after year, and the birds usually nest within a two-mile radius of the area.

Crucial deer winter range is found in the northeastern part of the study area. Year-long summer range for both deer and antelope is found throughout the WSA.

The WSA contains redband trout, a native fish, with limited range.

Outstanding raptor habitat is located in the Blitzen River Canyon as well as portions of Fish Creek Canyon.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the study area is in the Intermountain Sagebrush Province, and the potential natural vegetation is sagebrush steppe.

Nine ecosystems listed in the Basin and Range section of Oregon Natural Heritage Plan occur in this study area. The sagebrush communities are big sagebrush/Idaho fescue, big sagebrush/bluebunch wheatgrass, and low sagebrush/Sandberg's bluegrass. Western juniper dominated communities are western juniper/big sagebrush/Idaho fescue, western juniper/low sagebrush/Sandberg's bluegrass, and western juniper/bluebunch wheatgrass. Mountain mahogany in the southern Basin and Range Province, snowbrush and bittercherry community complex, and aspen groves are the other ecosystems in the area.

The study area is within 5 hours' driving time of one standard metropolitan statistical area with population over 100,000: Boise, Idaho.

Energy and Mineral Development

The geology, energy, and mineral resources of the Blitzen River wilderness study area were evaluated by interpreting and reviewing existing literature, mining claim and mineral leasing records, and mining or mineral occurrences. Additional information pertaining to the mineral resources of the WSA come from the State of Oregon's Department of Geology and Mineral Industries (DOGAMI) geochemical survey of the area.

The WSA is within the Steens Mountain geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

A portion of the WSA is rated highly favorable for the occurrence of metals, and the remainder of the WSA is moderately favorable for metals.

Table 3 shows the mineral potential classifications in the WSA. Map 6 shows the portion of the WSA rated high for metals.

As of January 1, 1984, there were no oil and gas or geothermal leases and no mining claims in the WSA. There are no records of mineral occurrences. Assay results from DOGAMI's geochemical survey show anomalies of manganese, mercury, and copper throughout the WSA and areas of anomalous silver, zinc, cobalt and barium. With the exception of barium, these are strategic and critical minerals; however, there are no known deposits of strategic and critical minerals in the WSA.

Surface rocks in the WSA are predominantly Steens Basalt, which consists of thin multiple flows of basalt and andesite approximately 15 million years old. Thin patches of rhyolite ash-flow tuffs occur sporadically throughout the area.

Vegetation

The most extensive community in the Blitzen River WSA is low sagebrush/bunchgrass. This community occurs all across the flat rocky plateau west of the Blitzen River and, to a lesser extent, east of the river. Many areas have been heavily invaded by western juniper, and in these areas western juniper is dominant. The estimated successional stage is mid to late seral. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) The climax vegetation is low sagebrush, Sandberg's bluegrass, and, in some areas, bluebunch wheatgrass or Idaho fescue.

Table 3. Classification of Energy and Mineral Potential, Blitzen River WSA (OR-2-86E)

Commodity	Area	Classification Level	Confidence Level
Metals (mercury, copper, gold, silver, molybdenum)	See map 6	4	D
	Rest of WSA	3	B
Geothermal	Entire WSA	2	B
Uranium/Thorium	Entire WSA	1	C
Coal	Entire WSA	1	D
Oil/Gas	Entire WSA	2	B
Tar Sands/Oil Shale	Entire WSA	1	D
Limestone	Entire WSA	1	D
Bentonite	Entire WSA	2	A
Diatomite	Entire WSA	2	A
Zeolite	Entire WSA	2	A
Sodium	Entire WSA	2	A

Legend
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

Scattered throughout the low sagebrush community are small juniper covered rock outcrops. The estimated successional stage is mid to late seral. The primary climax species are western juniper and bluebunch wheatgrass.

A big sagebrush/bunchgrass community occurs on areas with deeper soils throughout the study area. The big sagebrush community on the slopes of the Steens has been heavily invaded by western juniper and it dominates these sites. The estimated successional stage is mid-seral. The primary climax species are big sagebrush and bluebunch wheatgrass or Idaho fescue.

The other major plant community is the western juniper dominated sites associated with the steep rocky canyons of the Blitzen River, Fish Creek, and other streams. The estimated successional stage is late seral. The primary climax species are bluebunch wheatgrass, western juniper and big sagebrush on the south slopes, with Idaho fescue replacing bluebunch wheatgrass on the north slopes.

Other communities present to a lesser extent are mountain mahogany, aspen groves, meadows, and riparian areas. Mountain mahogany occurs in scattered patches on the plateaus east of the Blitzen River. It also dominates sections of the north slope of Fish Creek and Spring Creek. Estimated successional stage is late seral. The primary climax species are mountain mahogany and Idaho fescue.

Large aspen groves occur on small north slopes in the eastern portions of the WSA. The aspen groves have a limited understory of bluegrasses, mountain brome, and shade-tolerant forbs. Associated with the aspens are meadows and shrub patches. Meadow vegetation includes bluegrasses, sedges, and forbs. Estimated successional stage of these areas is mid-seral. The primary climax vegetation on the meadows is bluegrass and sedges, and in the aspen groves is aspen and associated shrubs.

Along the Blitzen River and Fish Creek are large riparian communities. The primary species are willow, dogwood, alder, chokecherry, and a wide variety of meadow grasses and forbs. The estimated successional stage of these areas is mid-seral. The climax species are not clearly known, but probably include many of those currently present.

Wildlife

The WSA contains a variety of wildlife habitat with a diversity of animals.

Riparian habitat contains a rich variety of wildlife and is a prominent feature of the WSA. Twenty-four miles of stream contain riparian habitat. Twenty-two of these stream miles in the Blitzen River and Fish Creek are habitat for redband trout. Other fish species include mountain whitefish, long-nosed dace, and mottled sculpin. Spotted frog, wandering garter snake, beaver, raccoon, valley quail, Lazuli bunting, yellow breasted chat, yellow warbler, spotted sandpiper, and Canada goose are a few of the species found in the riparian habitat along the Blitzen River and Fish Creek.

Talus and rimrocks along the streams and canyons provide habitat for western rattlesnake, sagebrush lizard, bobcat, bushy-tailed woodrat, canyon mouse, Great Basin pocket mouse, canyon wren, cliff swallow, big brown bat, little brown myotis (bat) and many other species. Raptors using the cliffs include golden eagles, American kestrels, and red-tailed hawks.

Other upland habitat varies greatly in vegetation and wildlife species. Low-elevation low sagebrush and big sagebrush provide good habitat for antelope in the western half of the WSA. Mule deer summer east of the Blitzen River, and there is crucial deer winter range in the northern half of the WSA. Water, forage, and cover are well interspersed providing good habitat for deer. Rocky Mountain elk are occasional visitors to the WSA.

Western rattlesnake, bullsnake,E Brk sparrows, horned larks, common nighthawk, sage grouse, golden eagle, black-tailed jackrabbit, least chipmunk, and coyote are a few of the other species using the sagebrush habitats. One sage grouse strutting ground has been located in the northeastern part of the WSA.

Common flicker, yellow bellied sapsucker, mountain bluebird, American kestrel and red-tailed hawk all use junipers or their cavities for nesting. Common flicker, yellow bellied sapsuckers and other cavity nesters also use aspens.

Proposed wildlife habitat projects in the WSA include reconstruction of Kundert Reservoir to provide a 30-surface-acre impoundment suitable for fish stocking and construction of 1.9 miles of fencing along Fish Creek to exclude cattle from the riparian areas.

Livestock Grazing

The WSA contains portions of four grazing allotments. Table 4 shows the existing and potential livestock use in AUMs (animal unit month, the amount of forage required by one cow and calf, or equivalent animals, for one month.)

Livestock developments proposed within the WSA include 3 spring developments, 5 reservoirs and a waterhole, and 2 miles of fence. These developments are proposed to improve management through better livestock distribution and protect spring resources. These projects would increase forage production in the WSA, and could result in a possible increase in licensed livestock use of up to 1,737 AUMs in two of the four allotments.

Existing livestock developments (among the man-made features mentioned in the Naturalness section) include a spring development, 47 reservoirs, and 32 miles of fencing.

Grazing operators frequently use motor vehicles on the ways and dead-end roads to distribute salt and monitor livestock. Horses are used for gathering and moving livestock.

Recreation Use

Recreation use in the Blitzen River WSA is oriented toward hunting and fishing. Primitive recreation activities include day hiking, backpacking and camping.

Mule deer hunting is very good throughout the WSA, while antelope hunting is good in areas west of the Blitzen River. Deer hunting use is high and antelope hunting low. Chukar hunting is moderate. In the fall of 1983, a controlled hunt for sage grouse was allowed, but there are no figures on the amount of visitor use associated with this hunt. A

Table 4. Existing and Potential Livestock Use, Blitzen River WSA (OR-2-86E)

Grazing Allotment	Licensed AUMs in Allot.	Period of use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs) [1]
N. Catlow (No. 6001)	7,042	04/01-10/31	0.2	7	0
S. Steens (No. 6002)	21,935	04/15-10/31	9	2,193	550
Fish Creek-Big Indian (No. 6003)	1,410	04/15-10/31	50	663	0
Frazier Field (No. 6006)	2,210	04/15-09/30	58	1,459	1,187
Totals	32,597			4,322	1,737

[1] Increases might or might not result in increased licensed use in the allotment (see narrative).

moderate amount of waterfowl hunting occurs along the Blitzen River, above Page Spring Campground. Most of the use occurs in the later months of the waterfowl season after better hunting areas freeze.

Outstanding fishing exists in the Blitzen River and a portion of Fish Creek. The area attracts a large number of anglers because of the remoteness and excellent fishing for large trout and most of the activity occurs on the Blitzen River.

Most hunting and fishing in the WSA is vehicle-oriented. Both deer and antelope hunters use vehicles on roads and ways throughout the WSA. Fishermen, chukar hunters, and waterfowl hunters use roads to approach the Blitzen River and Fish Creek. Some fishing is associated with hikers along the river from the WSA boundary at Page Springs Campground.

Day hiking, backpacking, and camping are the most common primitive recreation activities in this WSA. Use for these activities is high.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. The WSA currently produces 4,322 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

The economic value of existing outputs amounts to $32,588 annually and local personal income generated by existing outputs amounts to $36,175 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 51,890 acres to the National Wilderness Preservation System (NWPS). The new addition to the system would include approximately 15 miles of the Donner und Blitzen River canyon, about 6 miles of Fish Creek canyon, aspen and juniper groves, meadows, sagebrush-covered hills, crucial deer winter range, and a sagebrush strutting ground.

Wilderness designation would maintain or improve the natural qualities of the area as well as the outstanding opportunities for solitude and primitive forms of recreation. Closure of 18 vehicle ways totaling 56 miles would improve the naturalness of the area by eliminating most vehicle use and allowing the ways to revegetate.

Closing the ways would also improve solitude and primitive recreation by reducing motor vehicles in the study area. At present, there are approximately 8 miles of ways closed under the Steens Mountain Recreation Plan. These ways are all located on the east side of the Blitzen River around Fish Creek.

Access to inholdings by landowners may also involve use of vehicles on ways. Such vehicle use may also affect the naturalness of the area by not allowing ways to revegetate. The inholdings could be developed or used in ways which would adversely affect wilderness values on surrounding public lands.

The scenic values of the area would be maintained by precluding major developments within the WSA.

The **enhanced wilderness alternative** would designate 58,750 acres to the NWPS, assuming the 6,660 acres of private and split-estate inholdings and adjacent parcels could be acquired, and the 200 acres of public land is added. The environmental consequences of this alternative are similar to the all wilderness alternative. However, acquisition of the split-estate and private lands within the WSA would preclude development or use of the inholdings in ways which would impair wilderness values.

Along with the vehicle ways, about 14 miles of dead-end roads would also be closed. Eliminating vehicle use would prevent intrusions on solitude, improve the manageability of the area, and enhance opportunities for primitive recreation. The closure would also enhance naturalness of the area by allowing the roads to revegetate and become less noticeable.

The **preferred alternative** would add 21,530 acres to the NWPS, assuming 1,360 acres of private and split-estate inholdings and adjacent parcels could be acquired. The area which would be recommended as wilderness includes the Blitzen River Canyon, Fish Creek Canyon, and the northeastern portion of the WSA.

Wilderness values and special features including raptor habitat, crucial deer winter range, and a sage grouse strutting ground as well as the outstanding scenic quality which occurs in this portion of the WSA would be protected under this alternative. The opportunities for solitude and recreation would be confined to these canyon areas, where there are outstanding opportunities for these activities.

Closure of 6.5 miles of roads and 8 miles of ways would enhance the area's naturalness and opportunities for solitude and primitive recreation.

Wilderness values including those associated with the special features in the 31,720 acres recommended nonsuitable would be subject to disturbance from other resource uses.

Proposed range improvement projects within the western side of the WSA, including one waterhole, one spring development, and 2 miles of fence, would be built and could adversely affect the naturalness of the immediate vicinity of the projects. Other possible activities such as mining could further affect the natural character of the area.

Opportunities for solitude could be adversely affected in the area recommended nonsuitable as a result of additional vehicle access and use for new projects or possible mining operations. Depending on their location and the extent of disturbance to recreation attractions, possible mining activities could adversely affect primitive recreation values.

The **partial alternative** would add 8,590 acres to the NWPS, assuming acquisition of 820 acres of private and split-estate inholdings and adjacent parcels. Only in the Blitzen River Canyon and Fish Creek Canyon would wilderness values such as solitude, naturalness and primitive recreation opportunities, along with special features, be preserved under this alternative. This would include outstanding scenic quality, raptor habitat and some crucial deer winter range. The overall opportunities for solitude and primitive recreation would be reduced and confined to the two canyons.

Closure of 1 mile of way and 1/2 mile of road would enhance the area's naturalness and opportunities for solitude and primitive recreation.

Wilderness values in the western and southeastern portions identified as nonsuitable for wilderness under the partial alternative would be subject to the same effects as under the preferred alternative.

In the northeastern portions of the study area, also identified as nonsuitable under the partial alternative, three proposed reservoirs and two proposed spring developments would be built. Surface disturbing activities such as these or possible mineral development could adversely affect the natural character of the area.

Opportunities for solitude or primitive recreation in the northeastern part could be adversely affected as a result of additional vehicle access and use for new projects or possible mining operations.

Most of the crucial deer winter range, the sage grouse strutting ground, and outstanding scenic quality which occur in this area would be subject to disturbance from the development of other resources.

Under the **no wilderness/no action alternative**, all of the wilderness values and special wilderness features in the WSA would be subject to disturbances from other resource uses and activities.

The effects on specific wilderness values would be the same as those for the nonsuitable areas under the preferred and partial alternatives.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development. Acreages that would be withdrawn under each alternative, including acreages rated moderate or high for minerals, are shown in table 5.

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness.

Under the **all wilderness and enhanced wilderness alternatives**, the wildlife habitat improvement project at Kundert Reservoir would not be allowed, foregoing the opportunity to provide a 30-surface-acre impoundment suitable for stocking with fish. This project is in the area recommended as nonsuitable for wilderness under the **preferred and partial alternatives** and would be allowed. The project would add a warm water fishery to the area that does not currently exist.

Under the all wilderness, enhanced wilderness, preferred and partial alternatives, the proposed fence along Fish Creek might be appropriate in wilderness because it would correct the adverse effects of man's influence. A site-specific assessment would be prepared to determine if it conformed with Wilderness Management Policy. If this project is precluded, the opportunity to improve the riparian and aquatic habitat and increase fish and wildlife populations in this area would be foregone. This would also be the case if proposed livestock projects are precluded under these alternatives.

Under the **no wilderness/no action alternative**, both wildlife improvement proposals and the livestock improvement projects would be developed. Reconstruction of Kundert Reservoir would provide a 30-surface-acre impoundment suitable for stocking fish. The 1.9 miles of proposed fencing along Fish Creek would allow riparian shrubs to increase in density and vigor and would reduce bank erosion, improving the riparian and aquatic habitat, and benefitting riparian-dependent species. The projects would slightly increase wildlife populations, including big game and upland gamebirds, as well as moderate increases in fish populations through the creation of a warm water fishery.

Effects on Livestock Grazing

Under all of the alternatives, wilderness

Table 5. Effects of Alternatives on Energy and Mineral Development, Blitzen River WSA (OR-2-86E)

	Acres Withdrawn				
	All Wilderness	Enhanced Wilderness	Preferred	Partial	No Wilderness/ No Action
Total acres	51,890	52,090 [1]	20,170 [2]	7,770 [3]	0
Metals rated high	250	250	0	0	0
Metals rated moderate	51,640	51,840	20,170	7,770	0

[1] Figures include 200 acres of public land outside of WSA to be added under this alternative. Development also precluded on an additional 6,660 acres if private and split-estate land is acquired as proposed under this alternative.
[2] Development also precluded on an additional 1,360 acres if private and split-estate land is acquired as proposed under this alternative.
[3] Development also precluded on an additional 820 acres if private and split-estate land is acquired as proposed under this alternative.

designation for the Blitzen River WSA would not affect existing livestock use in any of the four grazing allotments.

Under the **all and enhanced wilderness alternatives**, the proposed projects (3 spring developments, 5 reservoirs and a waterhole, and 2 miles of fence) might or might not be allowed in wilderness, depending on a site-specific assessment of whether they would conform with Wilderness Management Policy. If they were not allowed, the opportunity to improve livestock distribution, protect spring resources and increase forage production in the WSA through better management of available forage would be foregone. Possible increases in licensed livestock use of up to 1,737 AUMs in the allotment would also be foregone.

The proposed range developments in the Blitzen River WSA have a benefit/cost ratio greater than 1:1.

Under the **preferred alternative**, wilderness designation might or might not preclude construction of the five reservoirs and two spring developments in the Frazier Field allotment. If all of the proposed improvements in the preferred alternative are not allowed, possible increase in licensed livestock use of up to 500 AUMs in the WSA would be foregone along with the opportunity to improve livestock distribution and protect spring resources.

Under the **partial alternative**, two reservoirs in the Frazier Field allotment might or might not be allowed. If not allowed, an opportunity to improve livestock distribution and increase the available forage in the WSA would be foregone, along with a possible increase in licensed livestock use of up to 150 AUMs.

Under the **no wilderness/no action alternative**, all of the proposed developments would be implemented, thus improving livestock management, protecting spring resources, and increasing the amount of available forage in the WSA.

Under all of the alternatives, the forage produced from the proposed pojects, if allowed (up to 1,737 AUMs), may be licensed if it is determined to be sustainable and all forage needs in the allotments have been considered.

Closing all of the ways under the all wilderness alternative would inconvenience the grazing operators in the WSA. Closing all of the roads, in addition to the ways, under the enhanced wilderness alternative would be a great inconvenience to the operators. Many of the grazing operators use these roads and ways to distribute salt, monitor livestock and check range improvements.

Under the preferred and partial alternatives, the closing of roads and ways would not affect the operator.

Effects on Recreation Use

The quality of and opportunities for primitive recreation would be maintained at their present level or improved under the **all wilderness alternative**. The quality of primitive recreation available within the study area would be improved with the closure of vehicle ways and elimination of off-road vehicle use. Due to the attractive features of the area, it is expected that primitive recreation would increase with wilderness designation.

Restrictions on vehicle use would reduce vehicle-oriented recreation associated with hunting, particularly antelope hunting. Some of the reduction in vehicle-oriented hunter use would be offset by increases in hunters who do not use vehicles for access. Because the 7 dead-end roads within the WSA would remain open to vehicle use under this alternative, the reductions in hunting use would not be significant. Overall recreation use of the area would decline only slightly, if at all, as increases in primitive recreation would offset most of the reduction in vehicle-oriented recreation.

Under the **enhanced wilderness alternative**, primitive recreation would also be maintained or improved. Closure of roads and ways would essentially eliminate vehicle use within the study area. This would further reduce the effects of vehicle use on the primitive recreation user. Vehicle-oriented recreation activities, particularly fishing and hunting for deer and waterfowl, would be adversely affected by this alternative. Although vehicle use would not be allowed within the WSA, hunting and fishing would continue, but use would be greatly reduced. Hunting in the area may shift from a vehicle-oriented activity to a more primitive type of recreational activity.

Because of vehicle restrictions under the enhanced wilderness alternative, there would be a decline in overall recreational use of the area. Primitive recreation use is expected to increase, but the increase probably would be insufficient to offset the loss of vehicle-oriented recreation.

Under the **preferred alternative**, primitive recreation activities would be maintained in the Blitzen River Canyon, the Fish Creek Canyon and the northeast portion of the WSA. As there is only a limited area where the roads and ways would be closed under this alternative, the amount of vehicle-oriented recreation would not be greatly reduced. The primary access route for fishing and waterfowl hunting, the road west of the Blitzen River, would remain open, so there would be no reduction in these activities. There may be a slight reduction of deer hunters who use the northeastern portion of the study area where the roads and ways would be closed.

Additionally, primitive recreation use would increase due to the area's attractions. This increase probably would more than offset reductions in vehicle-oriented recreation.

The quality of primitive recreation could be adversely affected throughout the portion of the study area recommended as nonsuitable for wilderness. This would include all the lands west of the Blitzen River Canyon. The range improvement projects currently planned for this part of the WSA would not adversely affect primitive recreation, but generally increasing vehicle use in this portion of the WSA would adversely affect primitive recreation opportunities.

The **partial alternative** would protect the quality of primitive recreation in the canyons of Fish Creek and the Blitzen River. The effects would be similar to those of the preferred alternative. However, there would be no loss in vehicle-oriented recreation activities under this alternative. Primitive recreation use is expected to increase, so overall recreation use of the area would increase.

In the area recommended nonsuitable for wilderness, primitive recreation would be subject to a reduction in quality, primarily due to generally increasing vehicle use.

Currently proposed range improvements would not have an adverse effect on primitive recreation in the area. However, any additional access these projects create could have an adverse effect, depending on the location and extent of disturbance.

Under the **no wilderness/no action alternative**, primitive recreation would continue to be subject to disturbance by existing vehicle access routes and use or by any new access created as a result of development activities. Vehicle-oriented recreation could benefit from any additional access. No significant effect on recreation use is expected.

If the proposed wildlife and livestock developments are implemented under any alternative, they would increase wildlife and fish populations slightly, which would increase recreation use correspondingly. If these projects are not allowed under the all wilderness, enhanced wilderness, preferred or partial alternatives, these increases would be foregone. The increases would be realized under the no wilderness/no action alternative. Overall, recreation use in the WSA would not be substantially affected by these projects.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 6 and 7. Table 6 shows the effects on economic value and table 7, the effects on local personal income. It is not known at this time whether individual proposed structural developments would be constructed if the area were designated wilderness.

The columns for the wilderness alternatives show the effects as a range of values dependent upon whether structural improvements, and/or grazing operator access were allowed.

Currently, vehicles are used for livestock management in the study area. The all wilderness, enhanced wilderness, preferred and partial alternatives would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $761 per year.

Table 6. Effects of Alternatives on Annual Economic Value, Blitzen River WSA (OR-2-86E) (1981 price levels)

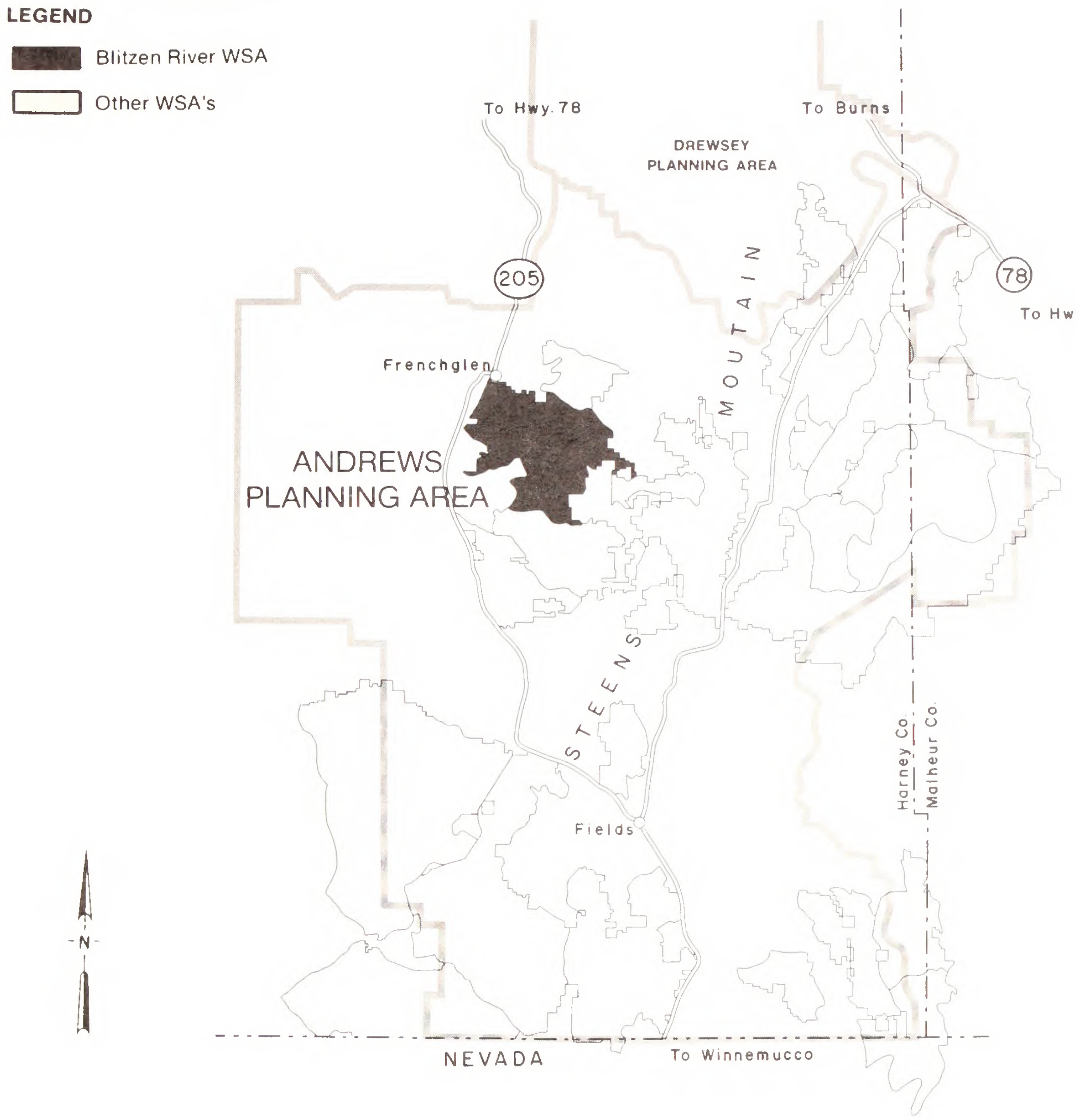
Item	Unit of Measure	All Wilderness, Enhanced Wilderness	Preferred	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Grazing:					
Investment [1]	AUM	0 to +1,237	+1,237 to +1,737	+1,587 to +1,737	+1,737
Big Game Hunting [2]	RVD	0 to +47	+12 to +47	+37 to +47	+47
Upland Game Hunting [2]	RVD	0 to +3	+1 to +3	+3	+3
Fishing [2]	RVD	0 to +229	+150 to +229	+150 to +229	+229
VALUE OF PLANNED INVESTMENTS [3]					
Grazing	$	0 to +13,097	+9,327 to +13,097	+11,966 to +13,097	+13,097
Big Game Hunting	$	0 to +1,066	+272 to +1,066	+840 to +1,066	+1,066
Upland game hunting	$	0 to +94	+31 to +94	+94	+94
Fishing	$	0 to +4,546	+2,978 to +4,546	+2,978 to +4,546	+4,546
Total	$	0 to +18,803	+12,608 to +18,803	+15,878 to +18,803	+18,803
Investments [4]	$	0 to -6,020	-2,921 to -6,020	-5,295 to -6,020	-6,020
Net Economic Value	$	0 to +12,783	+9,687 to +12,783	+10,583 to +12,783	+12,783
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS					
Reduced access [5]	$	-761	0	0	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS					
All categories	$	-761 to +12,022	+9,687 to +12,783	+10,583 to +12,783	+12,783

[1] Expected future increases due to range improvement investments.
[2] Expected future increases from proposed wildlife and livestock projects.
[3] Structural projects involving up to $74,715, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[4] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.
[5] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 7. Effects of Alternatives on Local Personal Income, Blitzen River WSA (OR-2-86E) (1981 price levels)

Item	Unit of Measure	All Wilderness, Enhanced Wilderness	Preferred	Partial	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS					
Grazing:					
Investment [1]	AUM	0 to +1,737	+1,237 to +1,737	+1,587 to +1,737	+1,737
Big Game Hunting [2]	RVD	0 to +47	+12 to +47	+37 to +47	+47
Upland Game Hunting [2]	RVD	0 to +3	+1 to +3	+3	+3
Fishing [2]	RVD	0 to +229	+150 to +229	+150 to +229	+229
INCOME FROM PROPOSED INVESTMENTS [3]					
Grazing	$	0 to +14,539	+10,354 to +14,539	+13,283 to +14,539	+14,539
Big Game Hunting	$	0 to +467	+119 to +467	+367 to +467	+467
Upland game hunting	$	0 to +46	+15 to +46	+46	+46
Fishing	$	0 to +2,611	+1,710 to +2,611	+1,710 to +2,611	+2,611
Construction Activity [4]	$	0 to +10,039	+4,871 to +10,039	+8,829 to +10,039	+10,039
Total [5]	$	0 to +17,663	+12,198 to +17,663	+15,360 to +17,663	+17,663

[1] Expected future increases due to range improvement investments.
[2] Expected future increases from proposed wildlife and livestock projects.
[3] Structural projects involving up to $74,715, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.
[4] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.
[5] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to a 5-year period. See footnote 4.



U. S. Department of the Interior
Bureau of Land Management

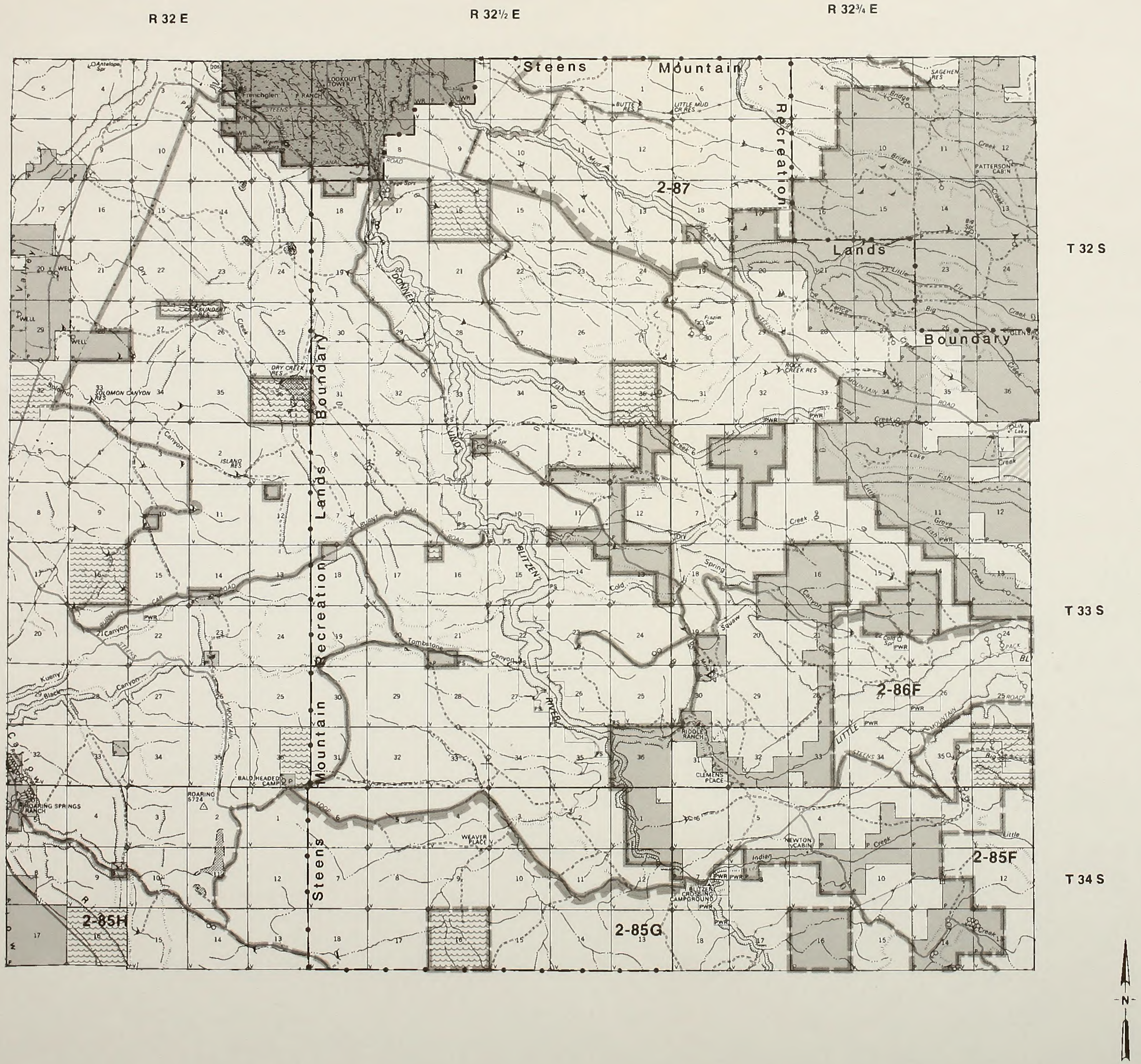
Burns District

Blitzen River WSA
OR-2-86E

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

▬ Wilderness Study Area Boundary

▬ ▬ Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

▒ Private

▨ State

■ National Wildlife Refuge

▤ BLM Surface-State or Private Subsurface (Split Estate)

U. S. Department of the Interior
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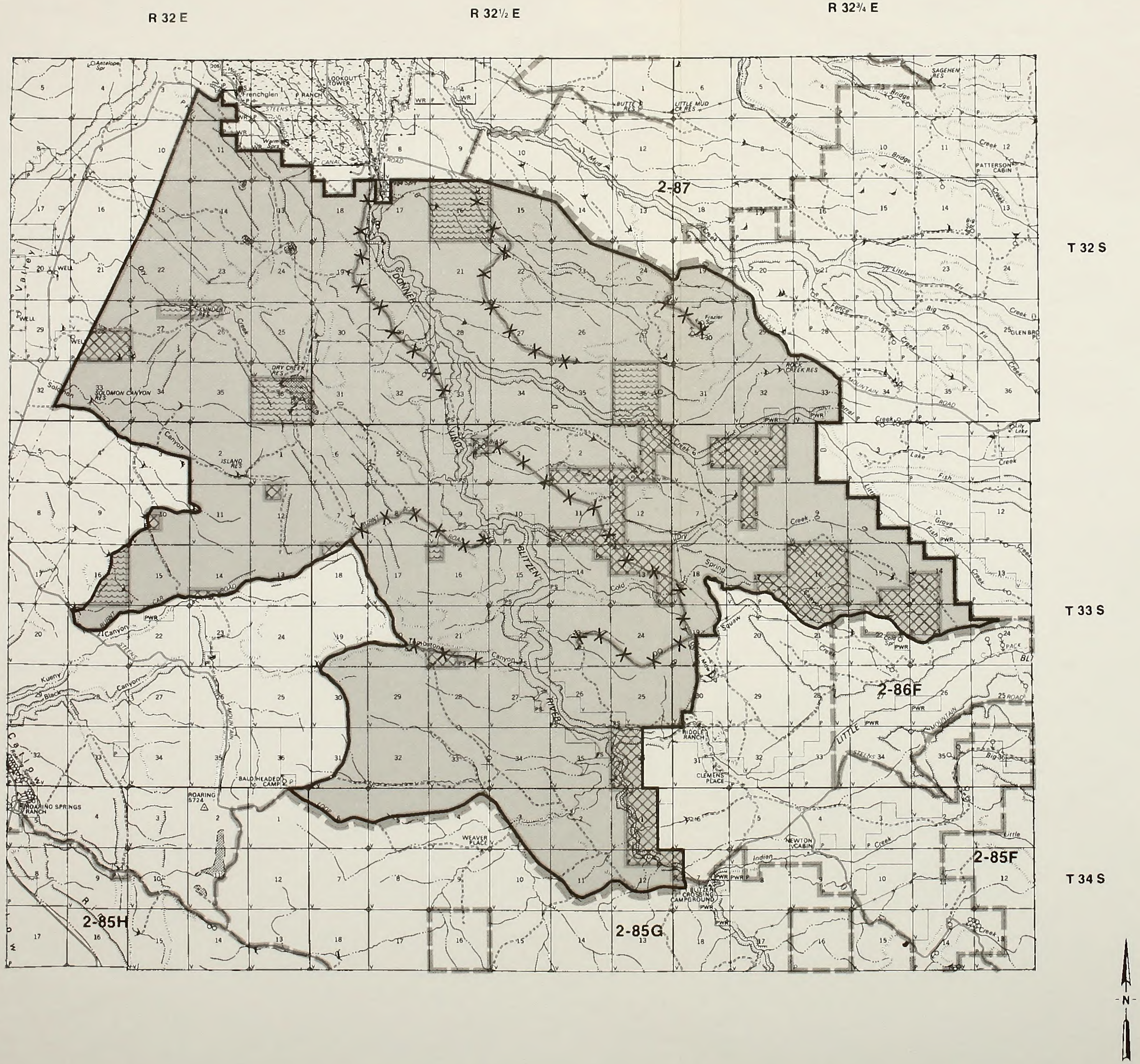
Burns District

Blitzen River WSA
OR-2-86E

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



LEGEND

- ▬ Wilderness Study Area Boundary
- ‒ ‒ Boundary of Adjacent Wilderness Study Areas
- ☐ Recommended Suitable for Wilderness
- ▩ Non-Federal Land within Recommended Wilderness
- ▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness
- X—X Recommended Road Closure

U. S. Department of the Interior
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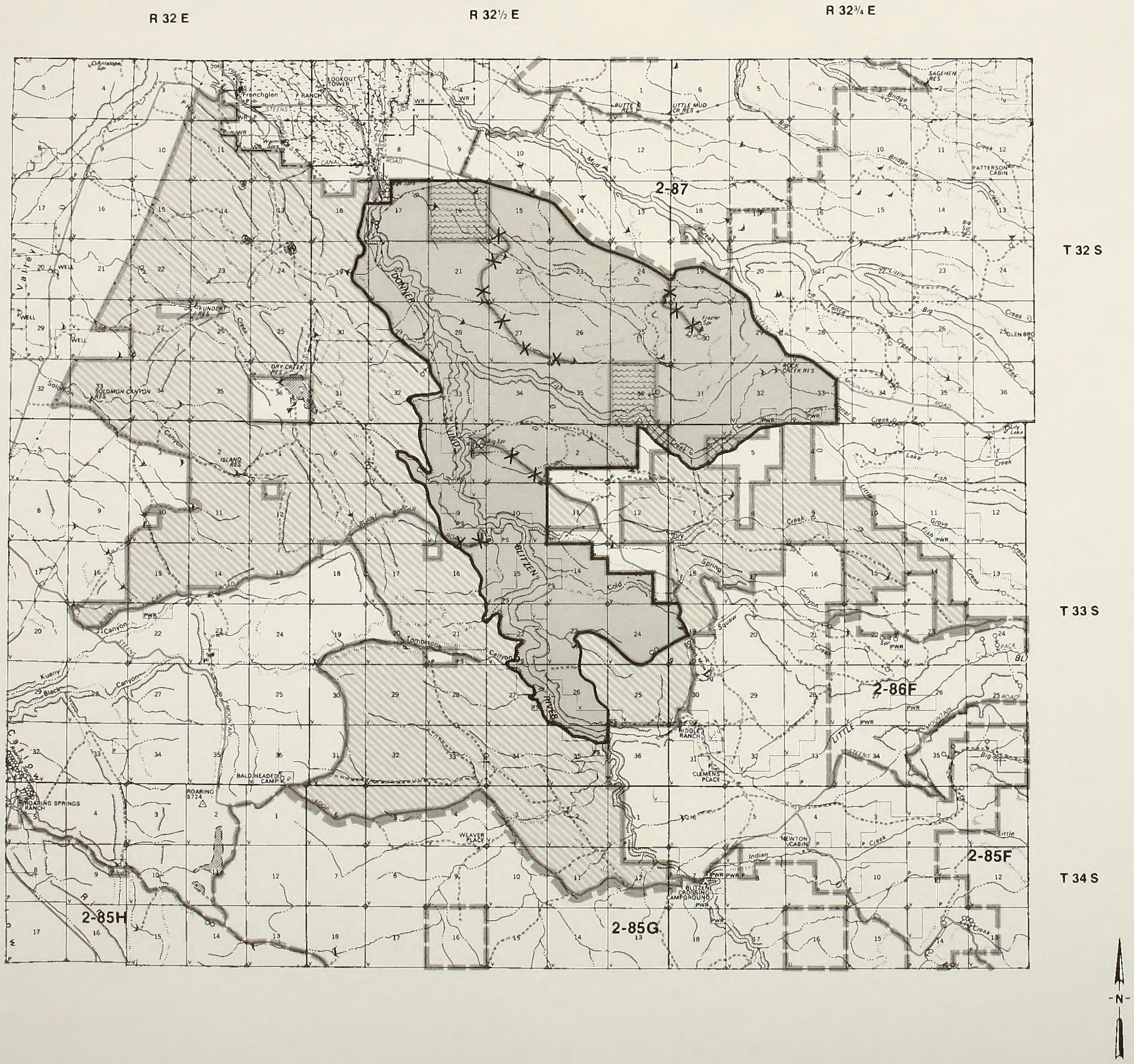
Blitzen River WSA
OR-2-86E

ENHANCED ALTERNATIVE

1 0 1 2 MILES

MAP 3



LEGEND

▬ Wilderness Study Area Boundary

-- Boundary of Adjacent Wilderness Study Areas

☐ Recommended Suitable for Wilderness

▨ Recommended Non-suitable for Wilderness

▩ Non-Federal Land within Recommended Wilderness

≋ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness

X X Recommended Road Closure

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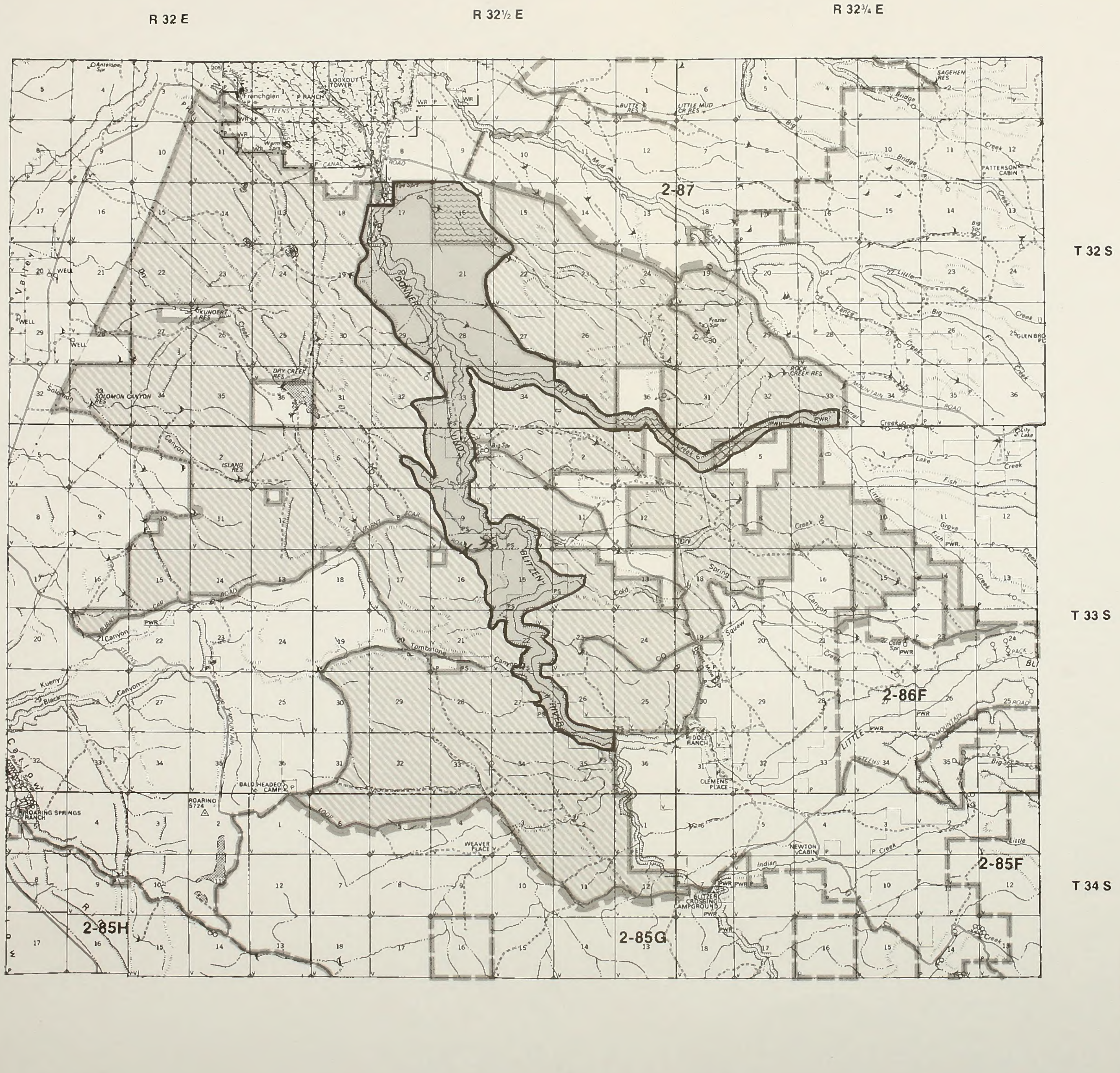
Blitzen River WSA
OR-2-86E

PREFERRED ALTERNATIVE

1 0 1 2 MILES

MAP 4



LEGEND

- Wilderness Study Area Boundary
- Boundary of Adjacent Wilderness Study Areas
- ▢ Recommended Suitable for Wilderness
- ▨ Recommended Non-suitable for Wilderness
- ▩ Non-Federal Land within Recommended Wilderness
- ▤ Non-Federal Minerals (Split Estate) within Area Recommended for Wilderness
- X—X Recommended Road Closure

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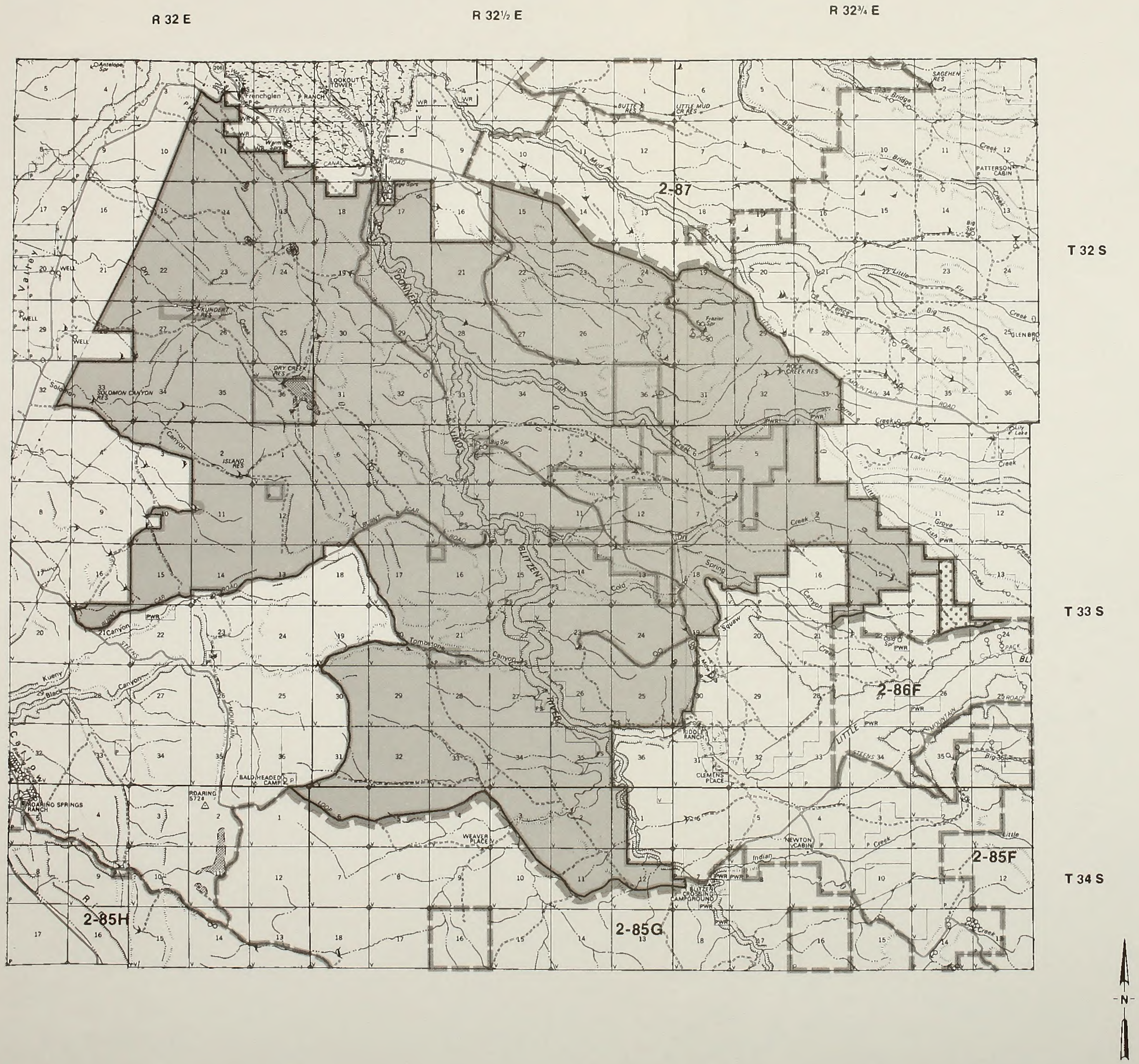
Blitzen River WSA
OR-2-86E

PARTIAL ALTERNATIVE

1 0 1 2 MILES

MAP 5



▨ **Medium Potential**
(3B) for Mercury, Copper, Gold, Silver and Molybdenum

░ **High Potential**
(4D) for Mercury, Copper, Gold, Silver and Molybdenum

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Blitzen River WSA
OR-2-86E

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 6

Blitzen River WSA, OR-2-86E. The western side of the study area from the ridgeline which parallels the western side of the Donner und Blitzen River looking southwest. Within the area recommended suitable under the enhanced and nonsuitable under the partial and preferred alternatives. Views from this point are extensive in any direction: Beatty Butte is visible on the horizon nearly 35 miles away. September 1983.

Blitzen River WSA, OR-2-86E. The Donner und Blitzen River in the center of the study area, looking south at the confluence with Fish Creek which enters the river in the foreground on the left. Within the area recommended suitable under the enhanced, partial and preferred alternatives. Sheer rock walls and stands of juniper characterize the river drainage. September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Bridge Creek Wilderness Study Area (OR-2-87)

General Description of the Study Area

The Bridge Creek wilderness study area (WSA) is located about 55 miles south of Burns and 3 1/2 miles east of Frenchglen in Harney County (see map 1). The area is about 3 1/2 miles east of Oregon State Highway 205 and is adjacent to the northern section of the Steens Mountain Loop Road.

The study area contains 14,060 acres of public land in a roughly square configuration (see map 2). Within the study area are a 480-acre parcel of split-estate land (federally managed surface, state or privately owned subsurface mineral rights) in the north central portion and a 40-acre parcel of private land in the southeastern corner.

The boundaries on the north and south are formed by BLM roads. The western boundary is formed BLM land with crested wheatgrass seedings and the boundary of the Malheur National Wildlife Refuge, while the eastern side of the study area is bounded entirely by private land. Also forming part of the western boundary is a dead-end road which extends toward the center of the study area for over 2 miles.

The Bridge Creek WSA lies on the western slope of Steens Mountain and slopes gently from east to west. The highest point in the study area is on the northeastern corner at 6,060 feet, while the lowest part is on the northwestern boundary at 4,260 feet.

The study area is deeply cut by two prominent drainages, Bridge Creek and Mud Creek, which cut through the area from east to west and are the primary features of the WSA. Both are steep canyons with sheer rock walls which reach a maximum depth of 400 feet in Mud Creek. The average depth of the canyons is about 175 feet in Bridge Creek and 200 feet in Mud Creek. Mud Creek and the lower four miles of Bridge Creek are perennial streams. The upper portion of Bridge Creek is intermittent.

Most of the land which lies between the drainages is flat to gently rolling. A number of small drainages cut through the flatter terrain prior to entering Bridge or Mud Creeks.

The dominant vegetation in the Bridge Creek WSA is big and low sagebrush and western juniper. Riparian vegetation occurs along Mud Creek and the lower portion of Bridge Creek.

Interrelationships

The Bridge Creek WSA lies adjacent and to the north of the Blitzen River WSA (OR-2-86E). The two study areas are separated by the northern portion of the Steens Mountain Loop Road. This well-used road is maintained regularly by BLM to provide access to the higher elevations of the mountain.

The southern two-thirds of the Bridge Creek WSA, most of the area south of Bridge Creek, lies within the BLM-managed Steens Mountain Recreation Lands, a large amount of land on Steens Mountain designated by BLM in 1971 in cooperation with local groups and government entities as well as private land owners. The purpose of the designation is to maintain a multiple-use-management concept on the mountain while protecting the area's natural condition.

The Oregon Department of Fish and Wildlife (ODFW) conducts deer herd counts in the area by low-level aerial flights during the winter and spring months. ODFW also intermittently stocks fish in Grandad Reservoir, located in the northern part of the WSA.

The U.S. Fish and Wildlife Service conducts a predator control program to control predator damage to livestock by aerially shooting coyotes.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- fire rehabilitation measures (Under BLM's wilderness management policy, watershed rehabilitation efforts could be undertaken to protect against the loss of wilderness values, life or property, or where rehabilitation is necessary to protect environmental conditions outside the wilderness); and

- wilderness recreation use (specificallybackpacking and horseback riding) adjacent to water sources and its effects on wildlife. (BLM's Wilderness Management Policy states that recreation use would be managed to protect the area's wilderness values.)

Also raised as an issue was the possibility of combining the Bridge Creek WSA with the adjacent Blitzen River WSA to form a single, larger wilderness area.

Description of the Alternatives

The following alternatives are analyzed:

- all wilderness
- no wilderness/no action (preferred alternative)

An enhanced wilderness alternative which would combine Bridge Creek with the Blitzen River WSA, propose acquiring the split-estate and private inholdings, and close the dead-end road, is not analyzed. Combining the two study areas would require closing the Steens Mountain Loop Road. This section of the loop road provides access for recreationists, private landowners, livestock users, and BLM personnel, and closing the road is not considered feasible.

Closing the dead-end road and acquiring the two inholdings would not significantly improve the area's manageability; also, it would not be substantially different from the all wilderness alternative.

A partial alternative is not analyzed because there are no opportunities to eliminate conflicting resource uses by recommending a portion of the WSA as suitable for wilderness and still provide an area which retains wilderness values.

All Wilderness

Under this alternative, all 14,060 acres of public land in the Bridge Creek study area would be recommended suitable as wilderness (see map 2). For purposes of analysis, it is assumed none of the inholdings would be acquired and the dead-end road which enters the WSA from the western boundary would remain open to vehicle use.

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- construction of proposed wildlife and livestock improvements, including reservoirs and pipeline for livestock use and riparian fencing for wildlife habitat improvement;

- continued use of motor vehicles for management and recreation, except that in the portion of the WSA within the Steens Mountain Recreation Lands, about 3 miles of vehicle ways (vehicle routes established and maintained solely by the passage of vehicles) are closed, and seasonal vehicle restrictions exist on the dead-end road and on other ways totaling about 3 miles (there would be no restrictions on vehicle use in the remainder of the area); and

- continued availability for mineral exploration and development.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The Bridge Creek WSA is manageable as wilderness under the all wilderness alternative. The dead-end road which enters the area from the west would present only a minor manageability problem if the area were designated as wilderness. Likewise, the split-estate and private inholdings would not result in substantial manageability problems. These parcels are outside the areas identified as moderately favorable for diatomite and there are no known plans to develop these parcels for other uses.

Table 1. Summary of Proposed Management Under Each Alternative, Bridge Creek WSA (OR-2-87)

Proposed Management	All Wilderness	No Wilderness/No Action
Acres Designated as Wilderness	14,060	0
Acres Closed to ORVs by Wilderness Designation	14,060	0
Miles of Ways Closed	4	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	14,060	0
Structural Wildlife Projects Developed:		
Fences (miles)	0-4.6	4.6
Structural Livestock Projects Developed:		
Reservoirs & Waterholes (number)	0-4	4
Pipelines (miles)	0-3	3

Boundary identification problems would not be expected along most of the eastern side of the WSA where the boundary is adjacent to private land, because, with the exception of the drainages, most of this boundary is already identified by fencing. Signing in the canyons would adequately reduce potential management problems resulting from recreational use in this part of the WSA.

Rationale for the Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred because the benefits of retaining options for construction of range projects and development of diatomite outweigh the benefits of preserving wilderness values. The WSA does possess the minimum wilderness characteristics for qualification as a wilderness study area but has few distinguishing features. The area is basically in a natural condition and possesses outstanding opportunities for solitude and several types of primitive recreation activities. These wilderness characteristics are primarily associated with the major drainages of Bridge and Mud Creeks. The study area's wildlife habitat and cultural resource values are special wilderness features, but there are no other exceptional values identified within the area.

Affected Environment

This section discusses only those activities or resources that influence the character of the study area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

Bridge Creek WSA is in a relatively natural condition. The study area contains 32 man-made features: 21 reservoirs, 4 fences totaling 6 miles, 6 ways totaling 7 miles, and 1 crested wheatgrass seeding of about 1,200 acres. The majority of the developments are scattered throughout the WSA in the area between the canyons, although a few reservoirs occur along the northern boundary. An estimated 12 percent of the study area is influenced by man-made developments. (The area of influence is an estimate of the acreage in the WSA from which these man-made features can be seen.)

Table 2. Summary of Environmental Consequences of Alternatives, Bridge Creek WSA (OR-2-87)

	No Wilderness/No Action	
Resource or Activity	**All Wilderness**	**(Preferred Alternative)**
Wilderness Values	Would add 14,060 acres to NWPS and preserve wilderness values and special features (cultural resources and wildlife), including features associated with Bridge Creek and Mud Creek. Closure of 4 miles of ways would enhance the area's naturalness and improve opportunities for solitude and primitive types of recreation. Although minor manageability problems occur due to inholdings, the area is manageable as wilderness.	Wilderness values and special features subject to possible disburbance from development of proposed range improvements and potential development of mineral resources.
Energy and Mineral Development	Development precluded on 14,060 acres, including 757 acres with moderate potential for diatomite.	No impact.
Wildlife	Wildlife habitat preserved. Opportunity to improve wildlife riparian habitat and increase some populations by fencing might be foregone. Proposed livestock projects, which would improve habitat and increase wildlife populations slightly, might be foregone.	Fencing to improve wildlife habitat would be permitted, resulting in an increase in wildlife and fish populations. Livestock improvement projects allowed, possibly increasing wildlife populations slightly.
Livestock Grazing	If proposed livestock projects are not allowed, opportunity to provide better utilization of existing forage in the WSA would be foregone, possibly foregoing the opportunity to increase licensed livestock use by up to 1,470 AUMs. Closing ways would not affect livestock management.	Range improvements would increase available forage within the WSA, and may result in an increase of licensed use of up to 1,470 AUMs within the allotments.
Recreation Use	Use of motorized vehicles for recreation would be restricted to one dead-end road. Recreation increases resulting from possible increases in wildlife populations (from livestock and wildlife projects) would not be significant. No change in overall recreation use.	Existing vehicle-oriented uses of the area would continue. Primitive recreation activities would be adversely affected by other activities. Recreation increases resulting from possible increases in wildlife populations (from livestock and wildlife projects) would not be significant. No change in overall recreation use.
Economic Value and Local Income	Decrease in economic value of $145 and no change in local personal income if proposed projects are not allowed. Increase in economic value and local personal income by $8,027 and $12,569, respectively, if proposed projects are allowed. The maximum increase in transportation costs to ranchers with grazing permits would be $145.	Increase in economic value and local personal income by $8,172 and $12,569 respectively, from construction of proposed projects.

The largest influence is a fire rehabilitation project in the northwestern corner of the WSA which was seeded to crested wheatgrass. The visual impact of this seeding does not extend much beyond the perimeter of the seeding itself, but within the seeded area the presence of drill rows creates a planted crop appearance.

Reservoirs scattered throughout the WSA create the next largest influence upon the area's naturalness, although these features are small and, individually, present only a minor visual impact. Most of the reservoirs are located in small drainages or are surrounded by vegetation, which reduces their visibility.

The visual influence of the ways and fences is slight. Most of the vehicle ways are located within the relatively flat portions of the study area which are covered with sagebrush, and the tracks are not readily seen. In addition, ways extending into the eastern portion of the WSA are frequently screened by juniper. Since none of the fences within the study area is bladed, the visual influence of these developments is also very minor.

Outside sights and sounds influencing the area are few and are primarily the result of the boundary roads. The Steens Mountain Loop Road forming the southern boundary is the outside development with the largest single influence. It receives heavy motor vehicle use during the summer, and its size and the amount of improvement it has received make it visible from a larger portion of the area than the other roads. The northern boundary road and the interior dead-end road have only a small visual influence because the topography screens these developments.

The seedings and fences which form the western boundary are visible for only a short distance into the WSA. They are (as are the other outside developments) on virtually the same plane from which they are likely to be viewed, and since this is generally a horizontal view, the impact of these developments is quite small.

Most of the fences which mark the eastern boundary are screened by juniper and are not a visual influence on any portion of the study area.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

Opportunities for solitude in the Bridge Creek WSA are outstanding. Topographic and vegetative screening as well as the size of the study area provide areas where visitors can find a secluded spot. However, this screening is primarily limited to Bridge and Mud Creek Canyons and the eastern portion of the WSA.

From the canyons of Bridge and Mud Creeks, the visitor is well screened from the remainder of the study area. Topographic screening within the canyons themselves is also good; the numerous bends and turns in the drainages restrict long views. The tributary drainages to these larger canyons provide some screening for visitors. Although these drainages tend to be relatively shallow throughout most of their length, they enhance the opportunities for solitude by providing some topographic relief from the gently rolling nature of the remainder of the WSA.

The presence of juniper in the eastern half of this study area enhances the visitor's ability to find solitude. Moderate to dense stands of juniper occur primarily along the drainage corridors. Although the density of the juniper cover lessens between the drainages, it is still sufficient to provide some screening for visitors. The major drainages also have a moderate amount of riparian vegetation which tends to enhance solitude.

The western portion of the WSA offers little screening. Single trees or small clumps of juniper occur only occasionally, and the predominance of big and low sagebrush cover offers little screening.

The area provides outstanding opportunities for primitive forms of recreation, including day hiking, camping, backpacking, hunting, and fishing. The opportunities for day hiking within the WSA are associated with Bridge Creek and Mud Creek. Backpackers and campers would probably use the same area.

Opportunities for hunting deer and elk are good in the eastern two thirds of the area where there is adequate cover. Opportunities for antelope hunting are poor throughout the WSA due to the low number of animals within the area. Opportunities for chukar hunting are good, with the best hunting found along the rims of the canyons. The opportunities for fishing are good due to redband trout in Bridge and Mud Creeks and Grandad Reservoir located in the northern part of the WSA.

Special Features

Wildlife and cultural features are special wilderness features in the WSA.

The WSA contains crucial deer winter range, a high-quality raptor nesting area, and a sage grouse strutting ground. The southern quarter of the study area, from the Steens Loop Road to Mud Creek is crucial deer winter range. Good raptor nesting areas are located along both Bridge and Mud Creeks. Golden eagles commonly nest in these canyons. Turkey vultures, American kestrels, common ravens, and great horned owls are other raptors which nest here.

A sage grouse strutting ground is located just south of Bridge Creek on the west side of the study area. This is a site where sage grouse conduct an extensive courtship dance prior to mating. The same area is often used year after year, and the birds usually nest within a one-mile radius of the area.

The WSA contains redband trout, a native fish with limited range.

Significant cultural resources have been found in the WSA. The little known sites are Piaute villages which are important because of their excellent state of preservation and their ecological context. (See the Cultural Resources section for more information.)

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the WSA is located in the Intermountain Sagebrush Province, and its potential natural vegetation is sagebrush steppe.

The WSA contains four ecosystems listed in the Basin and Range section of the Oregon Natural Heritage Plan. These include western juniper/big sagebrush/bluebunch wheatgrass and western juniper/big sagebrush/Idaho fescue which occur on the steep slopes of drainages. In areas of lower topographic relief, the ecosystems are big sagebrush/bluebunch wheatgrass and low sagebrush/Sandberg's bluegrass.

The study area is within 5 hours' driving time of one standard metropolitan statistical area with population over 100,000: Boise, Idaho.

Energy and Mineral Development

The geology, energy, and mineral resources of the Bridge Creek WSA were evaluated by interpreting existing literature, reviewing mining claim and mineral leasing records, and correlating rock units in the WSA with similar environments in other areas that are known to contain mineral deposits. Technical details of the findings of the evaluation are in a report of the assessment of mineral resources, Catlow Rim Geologic Resource Area (GRA OR-020-20), Harney County, Oregon, prepared by TERRADATA, a BLM contractor, and in a BLM report on the South Harney GRA.

The WSA is within a geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

Diatomite is rated moderately favorable for occurrence in portions of the WSA. The rating was based on the presence of tuffaceous lacustrine sediments similar to those in other Tertiary basins in southeastern Oregon which are known to contain diatomite.

Just west of the WSA is an area rated as moderately favorable for geothermal resources. The area consists of young volcanic rocks, three hot springs, and numerous deep-seated faults which have localized low-temperature geothermal potential which may be suitable for direct-use heat applications. The geothermal potential does not appear to extend into the WSA.

Table 3 shows the mineral potential classifications for the WSA. Map 3 shows the portions of the WSA rated moderate (medium) for diatomite.

Aside from abundant road aggregate sources, there are no known occurrences of mineral deposits within the WSA. There were no oil and gas or geothermal leases and no mining claims within the WSA, as of January 1, 1984.

The surface rocks are composed mainly of Steens Basalt which consists of numerous thin flows of olivine basalt with a cumulative thickness of several thousand feet and rare interlayers of tuff. Locally, the area is overlain with semi-consolidated lacustrine (lake) tuffaceous sediments and ash flow tuffs.

Table 3. Classification of Energy and Mineral Potential, Bridge Creek WSA (OR-2-87)

Commodity	Area	Classification Level	Confidence Level
Metals	Entire WSA	1	B
Geothermal	Entire WSA	2	B
Uranium/Thorium	Entire WSA	1	A
Coal	Entire WSA	1	B
Oil/Gas	Entire WSA	2	A
Tar Sands/Oil Shale	Entire WSA	1	C
Limestone	Entire WSA	1	C
Bentonite	Entire WSA	1	A
Diatomite	See map 3	3	C
	Rest of WSA	1	B
Zeolites	Entire WSA	1	A

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

Vegetation

Bridge Creek WSA contains three major plant communities; big sagebrush/bunchgrass, low sagebrush/bunchgrass, and juniper-dominated sideslopes.

The community which is the most extensive is low sagebrush/bunchgrass. This occurs on the flat stony ridges between the streams. Juniper invasion is very heavy in some areas and on these sites, western juniper dominates the overstory. The estimated successional stage is mid-seral. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.)The probable climax vegetation is low sagebrush, Sandberg's bluegrass, and bluebunch wheatgrass.

The big sagebrush/bunchgrass community occurs in the western and northwestern portions of the WSA. Crested wheatgrass and squirreltail grow in conjunction with cheatgrass and annual forbs in a recently burned area in the northwest corner. The estimated successional stage of the burned area is early seral. The successional stage of the rest of the community is mid-seral. The probable climax species are bluebunch wheatgrass and a small amount of big sagebrush.

Western juniper communities dominate the slopes of Bridge Creek and Mud Creek. On the north slopes, the primary species are big sagebrush, Idaho fescue, and bluegrass. In the eastern portions of the creek, mountain mahogany is co-dominant with juniper on these north slopes. Common species on the south slopes include bluebunch wheatgrass, Thurber's needlegrass, Sandberg's bluegrass, and rabbitbrush, in addition to western juniper and big sagebrush. The estimated successional stage of these communities is mid to late seral, and probable climax species are western juniper and big sagebrush with Idaho fescue on the north slopes and bluebunch wheatgrass on the south slopes.

There are small riparian areas along Bridge and Mud Creeks. Woody species include chokecherry, willow, and golden currant. The estimated successional stage is early to mid seral. Climax species are not clearly known, but probably include the shrub species previously mentioned as well as forbs and grasses.

Wildlife

The Bridge Creek WSA provides a variety of habitats for wildlife species. Wintering mule deer make heavy use of the juniper, big sagebrush and low sagebrush habitats found in the northern part of the WSA. Light deer use also occurs in the summer in this area. During the spring, pronghorn antelope use the seedings and burn area found at lower elevations, but they move to upper elevations during the summer. Occasionally elk use the WSA, generally during the winter.

Mud Creek and Bridge Creek canyons are important components of the wildlife habitat. Four golden eagle nests have been located near Bridge Creek and three near Mud Creek. At least one of these nests is usually active in each canyon. Other raptors nesting in the area include turkey vultures, American kestrels, common ravens, and great horned owls.

Songbirds include those commonly found near big sagebrush, low sagebrush, western juniper, riparian and cliff habitats. Some of these are Brewer's sparrow, western meadowlark, sage sparrow, mountain chickadee, robin, canyon wren, and yellow warbler. Common mammals include deer mice, least chipmunk, badgers, black-tailed jackrabbits, coyotes, and bushy-tailed woodrats near rimrocks and beaver near streams. One sage grouse strutting ground has been located just south of Bridge Creek in the northwestern part of the WSA. Chukars are found in the rocky canyons.

Riparian habitat occurs along 12.8 miles of stream courses within the WSA. Redband trout are found in 7.8 miles of Bridge and Mud Creeks, and rainbow trout are stocked in Grandad Reservoir. Grandad Reservoir is stocked intermittently by ODFW.

Proposed wildlife improvements in the WSA include construction of 4.6 miles of riparian fence along Mud Creek. By eliminating livestock grazing from the area, this fence would improve wildlife habitat by increasing the density and vigor of riparian shrubs.

Livestock Grazing

Portions of the study area are within three grazing allotments. Table 4 shows the existing and potential livestock use in AUMs (animal unit month, the amount of forage required by one cow and calf, or equivalent animals, for one month).

Table 4. Existing and Potential Livestock Use for Bridge Creek WSA (OR-2-87)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use in WSA (AUMs)	Potential Increase in WSA (AUMs) [1]
Krumbo (No. 6008)	4,920	04/16-05/30	10	603	1,300
Mud Creek (No. 6005)	562	05/15-06/30	81	345	120
Frazier Field (No. 6006)	2,210	04/01-08/31	9	275	50
Totals	7,692			1,223	1,470

[1] Increases might or might not result in increased licensed use in the allotment (see narrative).

Proposed livestock improvements within the study area include 4 reservoirs and 3 miles of pipeline . The projects would provide water in areas where there is available forage that is not being used efficiently by livestock due to the lack of water. The projects would allow better distribution of livestock and would increase the available forage in the WSA. They could result in an increase in licensed livestock use of up to 1,470 AUMs among the three allotments.

Existing livestock developments (among the man-made features discussed in the Naturalness section) include 21 reservoirs and 6 miles of fence.

During the grazing season, grazing operators use motor vehicles within the study area, primarily for livestock supervision and distributing salt. This use is generally restricted to the road. Horses are used to move and gather the livestock.

Cultural Resources

Remnants of several Paiute villages are located in the western portion of the WSA, generally in the lower elevations of the Steens Mountain Fault Block. The villages reflect prehistoric adaptation to diverse upland and riverine natural resources during seasonal or longer term occupations. House circles and tools for hunting and plant food processing are present in the area. These remain unstudied and are well-preserved.

Recreation Use

Existing recreational use in the Bridge Creek WSA is primarily oriented toward hunting deer, antelope, and chukar, with moderate levels of activity for each. Fishing use within both Bridge and Mud Creeks is low, with most of the use concentrated in Bridge Creek. Access into the area for hunting and fishing does not generally require the use of motor vehicles. However, in the area north of Bridge Creek, roads are commonly used to gain access to the remainder of the area.

Currently, the Bridge Creek WSA receives relatively low primitive recreation use that is not oriented to fishing or hunting. This is probably due to several factors, including the lack of attractions in the area and the relatively difficult access. Current recreation use is probably related to the WSA's proximity to the more attractive and much more heavily used portions of the Steens Mountain area. Consequently, recreation use within the WSA is probably dependent on use in the remainder of Steens Mountain.

Economic Value and Local Income

Livestock grazing and recreation are the only resource outputs which generate economic activity in this WSA. The WSA currently produces 1,223 animal unit months (AUMs) of livestock forage and an unknown amount of recreation activity annually. As of January 1, 1984, there were no oil and gas leases or geothermal leases on the WSA.

The economic value of existing outputs amounts to $9,221 annual and local personal income generated by existing outputs amounts to $10,200 annually. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 14,060 acres to the National Wilderness Preservation System (NWPS). It would preserve wilderness values in the two prominent canyons, Bridge Creek and Mud Creek and their associated recreational opportunities such as hunting, fishing, and hiking. The area which would be added to the NWPS also includes raptor habitat, crucial deer winter range and a sage grouse strutting ground.

Wilderness designation under this alternative would maintain or improve the natural qualities of the area as well as the outstanding opportunities for solitude and primitive types of recreation. Closure of 4 miles of ways would improve the naturalness of the area by eliminating most vehicle use and allowing the ways to revegetate.

Livestock operators would continue to use vehicles on the ways if there were no practical alternative means of maintaining existing livestock facilities; but use of vehicles probably would be on a very limited basis. Closing the ways would also improve opportunities for solitude and the quality of primitive recreation by eliminating motor vehicles.

The scenic values of the area would also be maintained by precluding major developments within the WSA.

Possible adverse effects could occur from the potential development of private and split-estate inholdings and the resulting need for access. There are no known plans for development at this time.

Under the **no wilderness/no action alternative**, wilderness values and special features of the entire WSA would be subject to disturbance from any proposed development, including possible development of mineral resources.

Proposed range improvements could adversely affect the naturalness of the area, since the proposed surface disturbing activities, such as reservoir construction, would be allowed. Other possible activities such as mining could further disturb the natural character of the area.

Opportunities for solitude could be adversely affected in the area as a result of any additional vehicle access and use for new projects or possible mining operations. Primitive recreation values could be adversely affected by projects or mining activities, depending on their location and the extent of disturbance to recreation attractions.

The raptor habitat, sage grouse strutting ground and crucial deer winter range identified as special wilderness features would also be subject to disturbance from development of other resources.

Effects on Energy and Mineral Development

Areas designated wilderness would be withdrawn from mineral exploration and development. Under the **all wilderness alternative**, 14,060 acres would be withdrawn, including the 757 acres rated moderately favorable for the occurrence of diatomite.

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Wildlife

Wildlife habitat would be preserved under the **all wilderness alternative**.

Under the all wilderness alternative, 4.6 miles of proposed riparian fencing along Mud Creek might be appropriate because it would correct the adverse effect of man's influence. A site-specific assessment would be prepared to determine if it conformed with Wilderness Management Policy. If built, it would increase the density and vigor of riparian shrubs, reducing bank erosion, which would have a beneficial effect on fish and wildlife habitat and populations.

Some of the proposed range improvements may be beneficial to wildlife habitat and lead to increases in wildlife populations.

Maintenance of some existing fences may be reduced, possibly resulting in cattle intruding into riparian areas. This would deteriorate riparian areas and cause a decline in populations of riparian-dependent species.

Under the **no wilderness/no action alternative** the proposed fencing would be built and maintenance of existing riparian fencing would continue.

Effects on Livestock Grazing

Under the **all wilderness alternative**, the proposed 4 reservoirs and 3 miles of pipeline might or might not be built, depending on a site-specific assessment of whether they would conform with Wilderness Management Policy. If not allowed, an opportunity to increase available forage in the WSA through better distribution of livestock would be foregone. Also foregone would be the opportunity to increase licensed livestock use within three allotments by up to 1,470 AUMs.

The pipeline and 1 of the reservoirs (in the Frazier Field allotment) have benefit/cost ratios of at least 1:1. The other 3 reservoirs (in the Mud Creek allotment) have benefit/cost ratios less than 1:1.

Under the **no wilderness/no action alternative**, the proposed developments would be constructed and currently unavailable forage for grazing could be effectively utilized by livestock.

Under both alternatives, the forage produced from the proposed projects and improved management (up to 1,470 AUMs) may be licensed if it is sustainable and all forage needs in the allotments have been considered.

Effects on Recreation Use

Overall recreation use would not be significantly affected under either alternative.

The quality of and opportunities for primitive recreation in the study area would be maintained at their present level or improved under the **all wilderness alternative**. Eliminating vehicle use on ways throughout the WSA would enhance the quality of primitive recreation. There would be a slight reduction of vehicle-oriented recreation. Since most of the recreational use in the WSA is not vehicle-oriented, except in the area north of Bridge Creek, hunting and fishing use would not be significantly affected. Visitor use would remain at existing levels.

Under the **no wilderness/no action alternative**, primitive recreation would probably continue at the current level. Primitive recreation could continue to be disturbed by existing vehicle use and by the proposed range improvement projects. Vehicle-oriented recreation could benefit from additional access associated with the development of range improvements.

Possible increases in wildlife populations due to the proposed wildlife and range projects (if allowed) would correspondingly increase recreation use slightly. This would not significantly affect recreation under either alternative.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 5 and 6. Table 5 shows the effects on economic value and table 6, the effects on local personal income. It is not known at this time whether individual proposed structural developments would be constructed if the area were designated wilderness. The column for the all wilderness alternative shows the effects as a range of values dependent upon whether structural improvements, and/or grazing operator access, were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The all wilderness alternative would restrict such vehicle use unless there were no practical alternative. The maximum impact from road closures upon the grazing operator in the WSA would be an increase in cost of about $145 per year.

Table 5. Effects of Alternatives on Annual Economic Value, Bridge Creek WSA (OR-2-87) (1981 price levels)

Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +1,470	+1,470
Big game hunting [2]	RVD	0 to +28	+28
Upland game hunting [2]	RVD	0 to +2	+2
VALUE OF PLANNED INVESTMENTS [3]			
Grazing	$	0 to +11,084	+11,084
Big game hunting	$	0 to +635	+635
Upland game hunting	$	0 to +63	+63
Total [4]	$	0 to +11,782	+11,782
Investments [5]	$	0 to -3,610	-3,610
Net Economic Value	$	0 to +8,172	+8,172
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS			
Reduced access [6]	$	-145	0
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS			
All categories	$	-145 to +8,027	+8,172

[2] Expected future increases due to range improvement investments.

[2] Expected future increases from proposed wildlife and livestock projects.

[3] Structural projects involving up to $44,810, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Detail may not sum to "Total" due to rounding.

[5] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[6] Additional cost (shown as negative value) due to restriction of vehicular access for livestock operator.

Table 6. Effects of Alternatives on Local Personal Income, Bridge Creek WSA (OR-2-87) (1981 price levels)

Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Grazing:			
Investment [1]	AUM	0 to +1,470	+1,470
Big game hunting [2]	RVD	0 to +28	+28
Upland game hunting [2]	RVD	0 to +2	+2
INCOME FROM PROPOSED INVESTMENTS [3]			
Grazing	$	0 to +12,260	+12,260
Big game hunting	$	0 to +278	+278
Upland game hunting	$	0 to +31	+31
Construction activity [4]	$	0 to +6,021	+6,021
Total [5]	$	0 to +12,569	+12,569

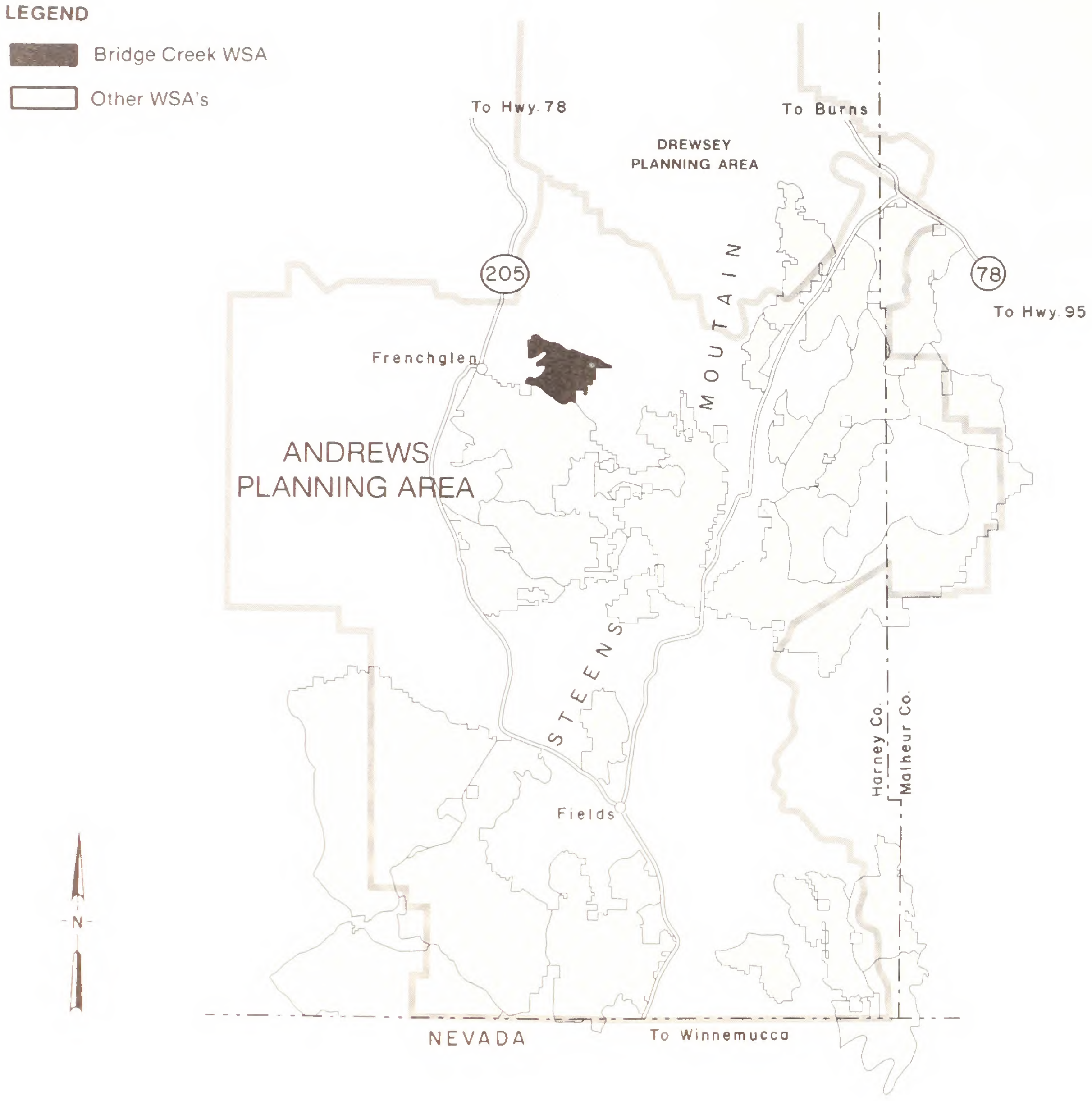
[1] Expected future increases due to range improvement investments.

[2] Expected future increases from proposed wildlife and livestock projects.

[3] Structural projects involving up to $44,810, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from grazing and hunting activity because it is not sustained over the analysis period.

[5] Detail may not sum to "Total" due to rounding. Total omits income from construction which is limited to 5-year period. See footnote 4.



U. S. Department of the Interior
Bureau of Land Management

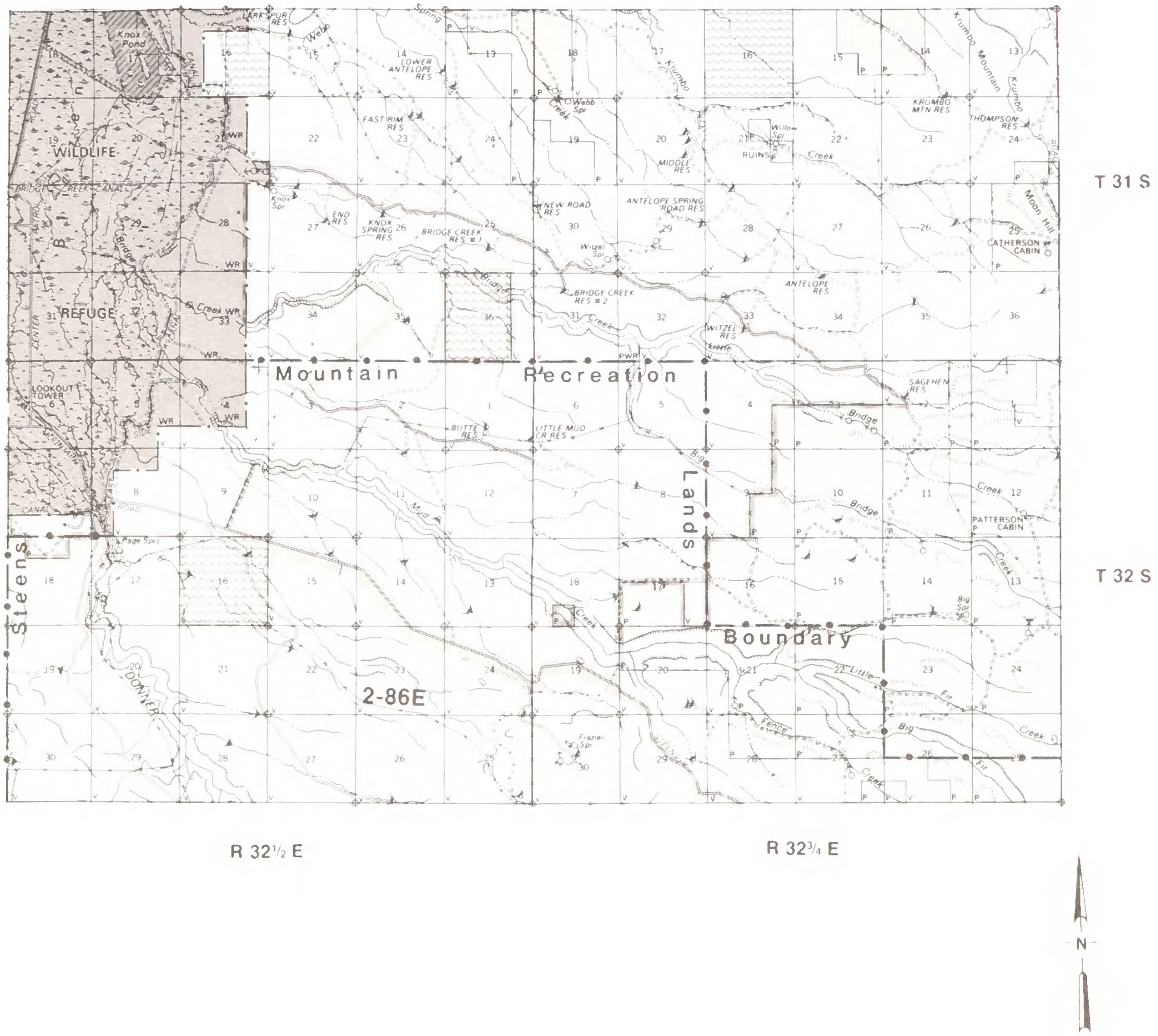
Burns District

Bridge Creek WSA
OR-2-87

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

Wilderness Study Area Boundary

Boundary of Adjacent Wilderness Study Areas

☐ Bureau of Land Management

☐ Private

▨ National Wildlife Refuge

░ BLM Surface-State or Private Subsurface (Split Estate)

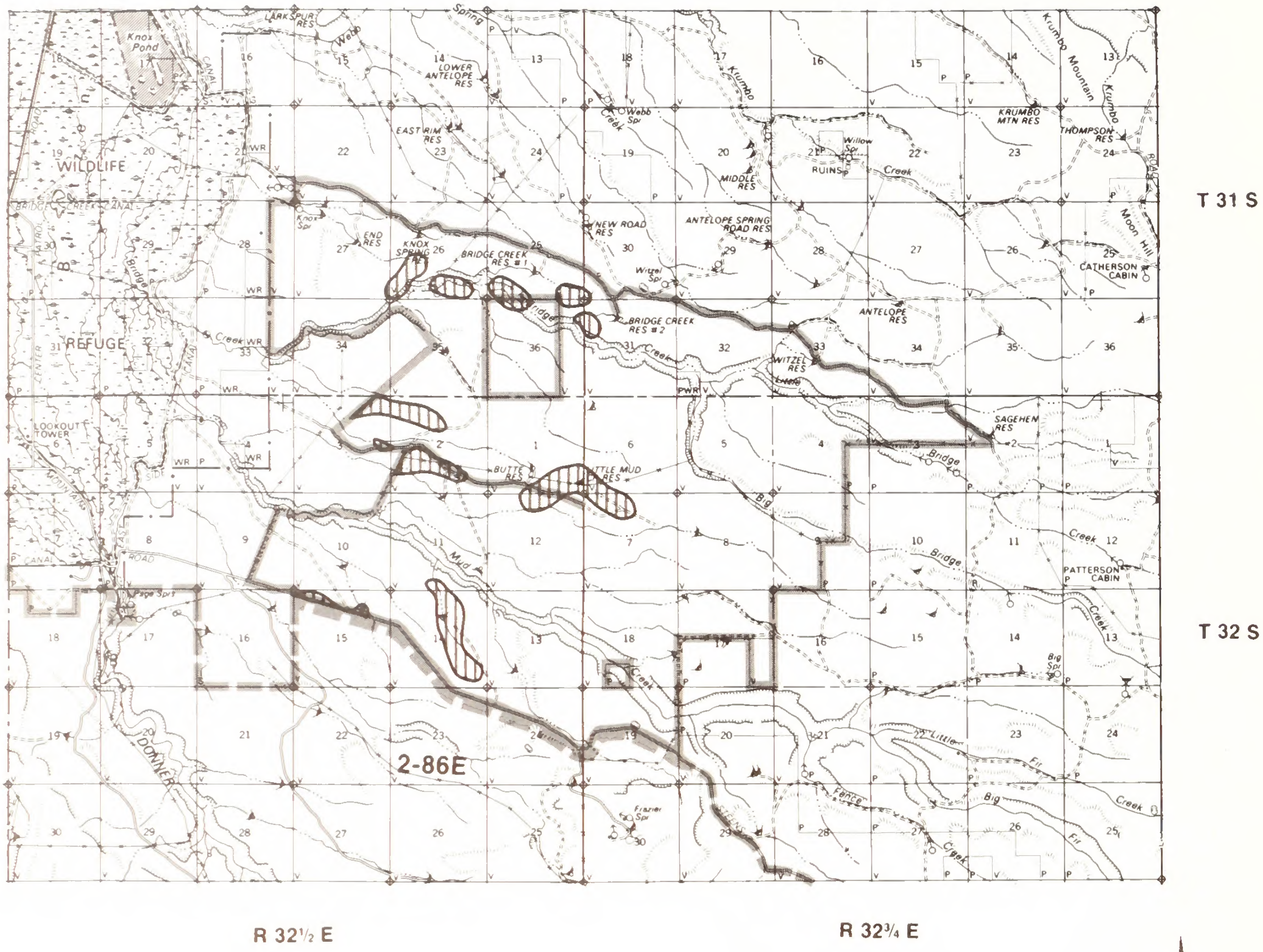
U. S. Department of the Interior
Bureau of Land Management
Burns District

Bridge Creek WSA
OR-2-87

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2



▥ **Medium Potential (3C) for Diatomite**

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Bridge Creek WSA
OR-2-87

MEDIUM OR HIGH POTENTIAL MINERAL OR ENERGY RESOURCES

1 0 1 2 MILES

MAP 3

Bridge Creek WSA, OR-2-87. The northwestern portion of the study area just south of Bridge Creek looking across the WSA to the southeast. Within the area recommended nonsuitable under the preferred (no wilderness/no action) alternative. This flat to rolling terrain is common between the drainages on the western side of the WSA. September 1983.

Bridge Creek WSA, OR-2-87. The north side of Mud Creek looking west. The ridgeline in the background is located outside the WSA to the south and west. This area is nonsuitable under the preferred (no wilderness/no action) alternative. Steep, rocky, juniper covered slopes dominate the drainages while scattered juniper, grass and sagebrush are common on the flatter terrain adjacent to the canyons (visible here on the far side of the drainage). September 1983.

Appendix to the Wilderness Environmental Impact Statement for Oregon

Aldrich Mountain Wilderness Study Area (OR-2-103)

General Description of the Study Area

The Aldrich Mountain wilderness study area is located three miles south of Dayville (and U.S. Highway 26) and 26 miles west of John Day in Grant County (see map 1).

The study area contains 9,395 acres of public land in an irregular configuration (see map 2). The area is over seven miles long with the widest point being three miles. In two locations the boundary narrows to a quarter mile. There are no inholdings of private or state land, but state land protrudes into the area in two locations in the central portion of the WSA which create the narrow portions of the boundary. Private land also protrudes into the area in the north.

With the exception of a BLM road which runs along the entire southern end of the WSA and a county road which forms a portion of the western boundary, the study area's boundaries are formed along legal subdivisions with adjacent non-public land. State land, managed by the Oregon Department of Fish and Wildlife (ODFW), bounds the western side of the WSA except for a segment of county road along less than two miles of the boundary.

The northern portion of the WSA is primarily bounded by private land although there are ODFW lands on the northeast. Most of the eastern boundary lies adjacent to the Malheur National Forest. Two parcels of private land also make up part of the eastern boundary. Also forming part of the boundary are two dead-end timber haul roads which extend about a mile into the study area on the east.

The study area is situated on the western side of Aldrich Mountain. It lies parallel to and just to the east of the South Fork of the John Day River. The area is located in the steep foothills of the mountain and contains a series of ridges and drainages. Smokey Creek and Oliver Creek are the major drainages which cut through the area from east to west but there are also a number of other smaller tributaries and drainages. Due to the narrow width of the area only small portions of the major drainages are included in the WSA.

The elevation of the area ranges from 2,560 feet on the lower slopes along the western boundary to 5,680 feet along the eastern boundary just north of Jackass Creek.

The vegetation within the area includes ponderosa pine and Douglas fir scattered, in the drainages and on the northern slopes in the higher elevations with sagebrush/grass and sagebrush/juniper communities in the lower foothills.

Interrelationships

The eastern boundary of the WSA is adjacent to land managed by the U.S. Forest Service. These lands were included in the Roadless Area Review and Evaluation (RARE II) but were not recommended for wilderness consideration. The RARE II areas involved were the Aldrich Mountain area No. 6233 and the Dry Cabin area No. 6236. These areas were released by the Oregon Wilderness Act of 1984 from further review of wilderness values until the National Forest plan revision expected in the 1990s.

ODFW conducts two programs within the Aldrich Mountain WSA. One is a census of antelope, deer, and elk. Census counts are taken 3 times annually by air. The other program involves a cooperative agreement with ODFW, which provides for coordinated management of state, BLM, and Forest Service land in the Murderer's Creek Wildlife Management Area. This designation recognizes the value of this area to big game and other forms of wildlife and provides management guidelines (including off-road vehicle restrictions) for maintaining the wildlife resource. The entire study area lies within the wildlife management area.

The U.S. Fish and Wildlife Service conducts a predator control program to reduce predator damage to livestock by aerially shooting coyotes.

A proposed addition to the State Recreation Trails System, tentatively named the Pacific Crest to Desert Trail (Ochoco-Malheur) would pass through Chickenhouse Gulch in the southern end of the WSA on an east-west route.

The entire WSA falls within lands which were ceded to the U.S. Government by the Warm Springs Indian Tribe by ratified treaty. This treaty reserved rights for hunting, fishing, and gathering in usual and accustomed places and grazing livestock on unclaimed land.

Issues

Issues relating to each WSA were raised by BLM and the public during the wilderness inventory and EIS planning and scoping process. These issues concern both the effects of wilderness designation on existing and potential land uses or resources in the WSA, as well as the effects of existing and potential land uses or resources on wilderness values. Land uses or resources raised as issues specifically for this WSA include:

- access across the study area to private land on the northern end of the WSA (the effects of wilderness designation on private lands are discussed in the Statewide EIS volume),

- existing commercial forest and timber harvest in the area,

- proposed range improvements for livestock grazing,

- possible restrictions on future wildlife habitat improvements proposed by ODFW for BLM-managed lands,

- protection for the area's wildlife and habitat, and

- potential exploration for and development of oil and gas or other mineral resources.

Description of Alternatives

The following alternatives are analyzed:

- all wilderness
- no wilderness/no action (preferred alternative)

Although considered, partial and enhanced wilderness alternatives are not analyzed for this study area. A partial alternative is not analyzed because there are no opportunities to resolve resource conflicts by reducing the size of the study area and still retain sufficient wilderness values to warrant wilderness management. An enhanced wilderness alternative is not analyzed because there is no practical alternative to significantly enhance wilderness values.

All Wilderness

The all wilderness alternative would recommend all 9,395 acres of the Aldrich Mountain WSA suitable for wilderness (see map 2). For purposes of analysis, it is assumed there would be no acquisition of adjacent private or state land for wilderness purposes. The two dead-end roads which enter the WSA would remain open to vehicle use.

No Wilderness/No Action (Preferred Alternative)

The no wilderness/no action alternative would recommend the entire WSA nonsuitable as wilderness. It represents the situation most likely to occur without wilderness designation. The area would be managed according to the current land use plan, which includes the following features relevant to this analysis:

- continued use of vehicles in portions of the study area, and restricted use within the Murderer's Creek Wildlife Management Area,
- continued availability for mineral exploration and development,
- construction of proposed livestock projects, including 1 reservoir, 1 spring development, 2.5 miles of fence, and 280 acres of seeding,
- development of wildlife improvement projects, including 2 guzzlers and 100 acres of vegetative manipulation, and
- harvest of timber on over 1,000 acres of commercial forest land.

Table 1 summarizes the proposed management of the WSA under each alternative.

Table 2 summarizes the environmental consequences of each alternative.

Manageability of the Area as Wilderness

The Aldrich Mountain WSA would be manageable as wilderness under the all wilderness alternative. However, some manageability problems could be expected.

The most significant manageability problem is the configuration of the study area's boundary. With the exception of the eastern boundary with Forest Service land and portions of the northern boundary with private land, the majority of the boundary is unmarked and otherwise unrecognizable. Although most of the remaining adjacent land is state-owned, and use of the state land by wilderness visitors would not likely cause serious problems, restricting visitor use to the narrow corridors of BLM-managed land would be difficult. In other words, it would be difficult to solely manage the BLM land as wilderness.

Table 1. Summary of Proposed Management Under Each Alternative, Aldrich Mountain WSA (OR-2-103)

Proposed Management	All Wilderness	No Wilderness/No Action
Acres Designated as Wilderness	9,395	0
Acres Closed to ORVs by Wilderness Designation	9,395	0
Miles of Ways Closed	3.5	0
Acres Withdrawn from Mineral Location and Leasing by Wilderness Designation	9,395	0
Structural Wildlife Projects Developed: Catchments & Guzzlers (number)	0-2	2
Vegetative Manipulation for Wildlife: Brush Control without Seeding (acres)	0	100
Structural Livestock Projects Developed:		
Reservoirs & Waterholes (number)	0-1	1
Springs (number)	0-1	1
Fences (miles)	0-2.5	2.5
Vegetative Manipulation for Livestock: Brush Control with Seeding (acres)	0	280
Acres of Timber Available for Harvest	0	1,082
Average Annual Volume of Timber Sold (Mbf-Thousand Board Feet)	0	76

Rationale for Selection of the Preferred Alternative

The no wilderness/no action alternative is preferred for the Aldrich Mountain WSA because the benefits of retaining options for resource development outweigh the benefits of preserving wilderness values. Although the study area contains a number of wilderness values -- including a relatively natural condition, outstanding opportunities for solitude and recreation, and scenic and wildlife values -- the benefits of preserving those values would be less than the benefits of developing the area's resources. The lands within the WSA have the potential for the development of livestock and wildlife habitat improvements, timber, and mineral resources.

Affected Environment

This section discusses only those activities or resources that influence the character of the study

Table 2. Summary of Environmental Consequences of Alternatives, Aldrich Mountain WSA (OR-2-103)

Resource or Activity	All Wilderness	No Wilderness/No Action (Preferred Alternative)
Wilderness Values	Would add 9,395 acres to the NWPS. Maintains or improves the quality of the area's wilderness characteristics and protects the special features. Includes the western slope and foothills of Aldrich Mountain, portions of several prominent drainages, and their associated scenic and wildlife values. Closure of 3 1/2 miles of ways would improve wilderness values. The area is manageable as wilderness, but the boundary configuration could lead to management problems.	Wilderness values and special features would be subject to possible disturbance from any future development.
Energy and Mineral Development	Development precluded on 9,395 acres, including 9,395 acres with moderate potential for asbestos and chromite.	No impact.
Vegetation	Vegetation preserved.	Timber harvesting would accelerate succession.
Wildlife	Wildlife habitat preserved. Opportunities to improve bighorn sheep habitat might be foregone.	Removal of old growth timber would displace species dependent on it, e.g., pileated woodpeckers. Population of cavity nesters would decline. Habitat improvements for bighorn sheep would be allowed.
Livestock Grazing	An opportunity to increase the available forage by as much as 179 AUMs might be foregone resulting in a possible reduction in licensed AUMs in the allotment. Closure of ways would inconvenience the livestock operator.	No impact. 179 AUMs of increased forage in the WSA realized, forestalling, possible reduction of 179 AUMs in the allotment.
Wood Products Harvest	Loss of 76 Mbf per year to the annual programmed harvest for BLM's Burns District.	No impact.
Recreation Use	Use of motorized vehicles eliminated, slightly reducing vehicle-oriented recreation use. Primitive recreation use would likely increase. Net increase in overall recreation use likely.	Existing recreation activities would continue. Primitive recreation activities subordinate to other resource uses. No change in overall recreation use.
Economic Value and Local Income	Decrease in annual economic value could range from $11,840 to $12,603, depending on what proposed projects would be allowed in wilderness. Decrease in local personal income could range from $19,401 to $20,230, depending on the same uncertain factors. Both sets of figures exclude unknown economic effects of mineral development and unquantified changes in recreation use.	Decrease in economic value by $1,849 and no change in local personal income from construction of proposed projects.

area, or that may be affected by the alternatives.

Wilderness Values

Naturalness

The Aldrich Mountain WSA appears to be in a relatively natural condition as the works of man are substantially unnoticeable. There are, however, 23 man-made features within the WSA. This includes 4 vehicle ways (a vehicle route established and maintained solely by the passage of vehicles) totaling 3 1/2 miles, 6 developed springs, 5 fences totaling 7 miles, 4 guzzlers (small wildlife watering devices), 2 old crested wheatgrass seedings covering 300 and 700 acres, and 2 areas of past timber harvest. These developments are scattered within the study area and influence approximately 3 percent of the WSA. (The area of influences is an estimate of the area from which these man-made features can be seen.)

The vehicle ways are relatively inconspicuous. In general, they are fairly well screened by vegetative cover and traverse the study area for short distances. In addition, two of the ways have been closed to vehicle use and signed as such. One of the ways in the northern portion of the WSA is somewhat more noticeable than the other routes. It is the longest of the 4 ways and crosses the southern edge of one of the old seedings, making it more visible due to the general lack of vegetative cover in the area. It receives light use from ranchers and/or hunters.

The developed springs and guzzlers are all small developments and most are well screened by vegetation or topography. Some of the guzzlers which are placed in more open areas are not substantially noticeable because of their small size and low profile.

The fences have only a slight visual influence in portions of the WSA. Most are visible only within the immediate vicinity of the development.

Little if any of the seedings in the study area would be noticeable to the average visitor. This is primarily because of reinvasion of other species due to the seedings' failure and the length of time since they were originally seeded. One of the seedings is located on the northern boundary (300 acres) while the larger seeding is on the southern boundary.

Timber was harvested in two areas (197.5 acres) on the eastern side of the study area. These sites were selectively logged (as opposed to clearcutting) before the wilderness review and are not visible from other portions of the WSA. They are only noticeable as evidence of man's presence within the harvested area.

Outside sights and sounds do not have a substantial influence on the area. They include distant views of ranches, the community of Dayville, and U.S. Highway 26. Although it forms part of the western boundary, the county road along the South Fork of the John Day River is partially screened from the study area and has little effect on the WSA.

Opportunities for Solitude or Primitive and Unconfined Types of Recreation

The Aldrich Mountain WSA offers outstanding opportunities for solitude. Both topographic and vegetative screening are available throughout most of the study area. The WSA has steep slopes with deep drainages which form diverse topography and enhances opportunities for solitude. Vegetative screening provided by Douglas fir and ponderosa pine, primarily along north-facing slopes, while riparian areas and scattered stands of juniper also provide sufficient screening in the lower elevations of the area.

Opportunities for primitive types of recreation are also outstanding within the study area and include day hiking, backpacking, camping, hunting, sightseeing, viewing wildlife, and photography.

The WSA offers good opportunities for hiking. There are numerous areas where the visitor could take somewhat leisurely hikes up a drainage or a more challenging hike up a ridgeline for rewarding views of the surrounding area from the higher elevations.

Opportunities for backpacking and camping are also good in the WSA. Most of the opportunities for camping in a relatively level spot are limited to the extreme western or southern portions of the area because of the steepness of the topography. There are a few level areas in the upper elevations but these are scattered and may be limited to ridge tops. Scattered camping areas are also located in the timbered area which offer a high degree of seclusion.

There are good opportunities for hunting mule deer, Rocky Mountain elk, and antelope in the Aldrich Mountain WSA.

Sightseeing, photography and viewing wildlife in the Aldrich Mountain WSA are good. Depending upon the time of year, there are opportunities to view deer, elk, antelope, and bighorn sheep in their natural habitat. In addition, not only is there scenic quality within the study area, but the higher elevation provides ample opportunities to view and photograph much of the surrounding country. This would include more of Aldrich Mountain to the east, the John Day River Valley to the north, the South Fork of the John Day River drainage and the Battle Creek Mountain area on the west and Murderer's Creek drainage to the south.

Opportunities for both solitude and primitive types of recreation are somewhat restricted by the configuration of the area's boundary. In areas where the boundary narrows to 1/4 mile the opportunities for solitude and recreation are limited. Such a configuration would also confine visitor movement within the WSA.

Special Features

Wildlife and scenic quality are special wilderness features in the study area.

Because of the variety of habitat and species which occur in the area and the dependency which certain animals have for portions of the WSA, wildlife are an important special feature. Outstanding wildlife habitat is found throughout the

WSA and includes summer antelope range, crucial elk winter range, crucial deer winter range, and year-round range for California bighorn sheep.

Portions of the Aldrich Mountain WSA have outstanding scenic quality. The area contains a variety of landform, color, and vegetation which all contribute to the scenic values.

Diversity in the National Wilderness Preservation System (NWPS)

According to the Bailey-Küchler system of classifying ecosystems, the WSA is in the Rocky Mountain Forest Province, and its potential natural vegetation is western ponderosa pine and sagebrush steppe.

Ten of the vegetative communities listed in the Ochoco, Blue, and Wallowa Mountains section of the Oregon Natural Heritage Plan occur in this WSA. These include ponderosa pine/bluebunch wheatgrass communities with separate areas of Idaho fescue and Douglas fir-ponderosa pine/elk sedge within the mixed conifer forest. There are western juniper/bluebunch wheatgrass and western juniper/big sagebrush communities at lower to mid-elevations of the WSA. There are big sagebrush/bunchgrass and low sagebrush/bunchgrass communities inside the forest zone. A bluebunch wheatgrass-Idaho fescue-Sandberg's bluegrass complex and mountain mahogany/bunchgrass communities are found within the same elevation as the juniper area. The low elevation riparian forest has cottonwoods, hawthorn, and alder and the high elevation riparian forest has birch, alder, and dogwood.

The study area is within 5 hours' driving time of 6 standard metropolitan statistical areas with populations over 100,000: Boise, Idaho; Portland, Salem and Eugene/Springfield, Oregon; and Richland/Kennewick/Pasco and Yakima, Washington.

Energy and Mineral Development

The geology, energy, and mineral resources of the Aldrich Mountain WSA were evaluated by interpreting existing literature, reviewing mining and mineral leasing records, and correlating rock units in the WSA with similar environments in other areas that are known to contain mineral deposits. Technical details of the findings of the evaluation are incorporated in report on the Aldrich Mountain geologic resource area, Grant County, Oregon, prepared by TERRADATA, a consulting firm under contract with BLM.

The WSA is within the Aldrich Mountain geologic resource area which has been classified according to a rating system that indicates both the potential for occurrence (geologic favorability) of certain minerals, as well as the quantity and quality of data on which the rating is based (confidence level). A description of the rating system is provided in the Statewide EIS volume.

The entire study area has moderate favorability for the occurrence of chromite and asbestos. The presence of serpentine provides a favorable environment for the occurrence of chrysotile asbestos and indicates the presence of other rock types associated with occurrences of chromite. These rocks may underlie the entire WSA. Several chromite prospects occur just west of the WSA and an undetermined amount of chromite has been produced. Chromium and chrysotile asbestos are both considered to be strategic and critical minerals; however, there are no known deposits of strategic and critical minerals in the WSA.

Table 3 shows the classifications of mineral potential in the WSA.

Table 3. Classification of Energy and Mineral Potential, Aldrich Mountain WSA (OR-2-103)

Commodity	Area	Classification Level	Confidence Level
Metals/Non-Metals (asbestos, chromite)	Entire WSA	3	B
Geothermal	Entire WSA	1	C
Uranium/Thorium	Entire WSA	1	A
Coal	Entire WSA	2	B
Oil/Gas	Entire WSA	2	B
Tar Sands/Oil Shale	Entire WSA	2	A
Limestone	Entire WSA	1	B
Bentonite	Entire WSA	2	C
Diatomite	Entire WSA	1	C
Zeolite	Entire WSA	1	B

Legend:
Class 1 - Lack of indications of favorability
Class 2 - Low favorability
Class 3 - Moderate favorability
Class 4 - High favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Director evidence but quantitatively minimal
Confidence Level D - Abundance direct and indirect evidence

Aside from abundant road aggregate sources, there are no known mineral deposits within the WSA. There were no mining claims in the study area as of January 1, 1984. There were 2 oil and gas leases as of January 1, 1984, covering 1,635 acres of the WSA.

The oldest rocks occur in small exposures in the northern portion of the study area. These include small masses of diorite and granite, some volcanic rocks, serpentine and a small area of marine sandstones and conglomerate. Most of the remainder of the WSA has been covered by younger tuffs and flows of basalt and rhyolite, as well as small deposits of sedimentary rocks.

Vegetation

The major vegetation communities within the Aldrich Mountain WSA are forested sites, sagebrush/bunchgrass communities, and juniper bunchgrass communities.

The forested sites occur on the steep north-facing slopes which are in the upper and headland portions of the steep canyons. The sites are commonly dominated by Douglas fir with elk sedge as the primary understory species. Snowberry, bitterbrush, Idaho fescue, and pinegrass are other commonly occurring species. On the southerly aspects which are forested, ponderosa pine and mountain mahogany are the common overstory species. Idaho fescue, elk sedge, big sagebrush and bitterbrush occur in the understory.

The estimated successional stage of the forested sites is mid to late seral. (Seral refers to a stage of ecological condition based on the difference between the present plant community and climax vegetation, the relatively stable, final stage in plant succession.) The probable climax vegetation is Douglas fir, grand fir, and elk sedge on north aspects and in the canyons. On the south aspects which are forested, ponderosa pine, elk sedge, and junegrass are the probable climax species.

Big sagebrush/bunchgrass communities are found on the rims and steep, rocky slopes below the forested sites. The understory species associated with the big sagebrush vary with the aspect. Western juniper trees occur throughout these communities but are not a dominant species. The estimated successional stage of the big sagebrush/bunchgrass communities is mid-seral. The probable climax species are big sagebrush, and, depending on the aspect, Idaho fescue, bluebunch wheatgrass, or Sandberg's bluegrass.

Juniper/bunchgrass communities are found on the benches below the rims and steep slopes. Other species commonly found on the benchlands are big sagebrush, Sandberg's bluegrass, Thurber's needlegrass, bluebunch wheatgrass, cheatgrass, and rabbitbrush. The estimated successional stage of the juniper/bunchgrass sites is mid-seral and the probable climax species are western juniper, big sagebrush and bluebunch wheatgrass. Sandberg's bluegrass will be the climax grass species on the more shallow soils.

Wildlife

This WSA contains high wildlife values. The distribution of cover, water, and forage is good over most of the WSA. Approximately 1,500 acres near Murderer's Creek has poor cover and poor forage quality.

California bighorn sheep were released by ODFW on the north side of Oliver Creek near Aldrich Mountain in 1978. They have become established yearlong in this area and presently number an estimated 50 to 60 head. Key areas are the mid and upper elevations of the Smokey Creek and Oliver Creek drainages.

Mule deer use the area yearlong, but most of the use occurs during the winter. All of the WSA is deer winter range. Mule deer move into the area from as far away as the Strawberry Mountains. The lower elevations are crucial deer winter range.

Rocky Mountain elk range over the WSA, but most of their use occurs in the timbered areas and juniper covered slopes during the winter. Chickenhouse Gulch, Smokey Creek, Jackass Creek, Oliver Creek and other drainages are crucial elk winter range.

Antelope summer on the open, low elevation slopes along Murderer's Creek and the northernmost section of the WSA during the winter.

Chukar are found over much of the rougher topography. Valley quail are found along streams and brushy drainages. Both species are yearlong residents. Mourning dove range over the area as summer residents. Common flicker, western meadowlark, western bluebird, Stellar's jay, Lewis' woodpecker, robin, American kestral, coyote, bobcat, deer mouse, mountain cottontail, bush-tailed woodrat, bull snake, and western rattlesnake are a few of the wildlife species found in the area. Beaver, mink, raccoon, weasels, and yellow warbler are also found in the WSA.

Mountain lions and black bear are present, but are uncommon.

Proposed improvement projects for wildlife include 2 guzzlers and five 20-acre burns. The guzzlers would be constructed in order to expand bighorn use into areas that have adequate habitat but are limited by the amount of available water. The purpose of the burn areas would be to improve forage palatability.

Livestock Grazing

The WSA includes portions of two grazing allotments. Table 4 summarizes current and potential livestock use in AUMs (animal unit months, the amount of forage required by one cow and calf or equivalent animals, for one month).

Several range improvements are proposed for the Smokey Creek allotment. The proposed improvements include 2.5 miles of fence construction, brush control and reseeding about 280 acres in an old crested wheatgrass seeding to an intermediate wheatgrass mix with crested wheatgrass, 1 reservoir and 1 spring development. As a result, 179 AUMs of additional livestock forage would be made available in the WSA. However, licensed livestock AUMs in the allotment would not change. Existing livestock improvements (among the man-made features mentioned in the Naturalness section) include 6 spring developments, 7 miles of fence, and the old seeding.

Grazing operators use motorized vehicles for access within and around this area primarily to distribute salt, monitor cattle, and transport horses. Horses are used to trail livestock to and from the area of use.

Wood Products Harvest

Aldrich Mountain WSA contains 1,153 acres of commercial forest land. Of this total, 71 acres are too rocky or otherwise not harvestable. The remaining 1,082 acres contribute 76,000 board feet (76 Mbf) per year to BLM's programmed timber harvest for the Burns District. The commercial forest areas contain large old-growth ponderosa pine (488 acres).

The study area contains two sites which have been previously logged. The larger of the two areas is 120.5 acres. The timber harvest method on 117.5 of 120.5 acres was a partial cut which involved overstory removal. The other 3 acres at this site were clearcut to provide a road right-of-way. This area has several access routes. It is currently timbered.

Seventy-seven acres were previously logged by selective logging methods. This area also contains access roads and is now timbered.

Throughout the remainder of the study area, access is limited and the terrain is rugged. Almost all future logging operations would have to be done by helicopter.

Recreation Use

Existing recreation use in the study area is primarily oriented toward hunting. Because of the limited amount of vehicle access in the area, hunting use within the WSA is not vehicle oriented. The area provides moderate visitor use for both deer and elk hunting.

Other primitive recreational activities account for a low amount of visitor use.

Economic Value and Local Income

Livestock grazing, oil and gas leasing, timber

Table 4. Existing and Potential Livestock Use, Aldrich Mountain WSA (OR-2-103)

Grazing Allotment	Licensed AUMs in Allot.	Period of Use	Percent of Allot. in WSA	Current Actual Use WSA (AUMs)	Potential Decrease in WSA (AUMs)
Smokey Creek (No. 4124)	307[1]	09/01-11/30	92	60	179
Murderer's Cr. (No. 4020)	860	05/01-07/30	43	171	0
Totals	1,167			231	179

[1] Current actual use in this allotment is 60 AUMs.

and recreation are the only resource outputs which generate economic activity in this WSA. As of January 1, 1984, there were 1,635 acres of oil and gas leases and no geothermal leases on the WSA.

Economic value and local personal income generated from existing levels of resource outputs of these lands are presented in table 5. The terms economic value and local personal income are discussed in the Statewide EIS volume.

Environmental Consequences

This section discusses the environmental consequences of implementing each of the alternatives. Resources and activities not significantly affected by any of the alternatives are not discussed. General impact conclusions applicable to all WSAs, including impact conclusions based on speculative future developments (developments which are possible, but are not currently proposed), are discussed in the Statewide EIS volume. That volume also discusses certain assumptions that were made for this analysis.

Effects on Wilderness Values

The **all wilderness alternative** would add 9,395 acres of public land to the National Wilderness Preservation System (NWPS). It would protect the area's wilderness qualities and the values associated with the steep ridgelines and narrow drainages of the western slope of Aldrich Mountain. Also included under wilderness protection would be the special scenic and wildlife features in the area.

Wilderness designation would maintain or improve the natural qualities of the study area as well as the outstanding opportunities for solitude and primitive types of recreation. Closure of the vehicle ways, totaling 3 1/2 miles, would improve the naturalness of the area by eliminating most vehicle use and allowing the ways to revegetate and become less noticeable. The quality of solitude and primitive recreation would also be improved by eliminating the use of motor vehicles within the WSA. (Approximately 3/4 mile of way currently have seasonal closures from December 1 through April 30 as part of the Murderer's Creek wildlife management area.)

Under the **no wilderness/no action alternative**, wilderness values and special features of the entire study area would be subject to disturbance from mineral development, timber harvest, and the implementation of range improvements. These potential surface disturbing activities would adversely affect the study area's naturalness. Opportunities for solitude and primitive recreation could also be adversely affected by any new vehicle access resulting from development activities. Depending on the location and extent of disturbances, the special features, particularly scenic values and existing big game (deer, elk, and bighorn sheep) habitat, could be adversely affected.

Effects on Energy and Mineral Development

Areas designated as wilderness would be withdrawn from mineral exploration and development. Under the **all wilderness alternative**, 9,395 acres would be withdrawn. All of this acreage has moderate potential for metals including chromite and chrysotile asbestos.

No acreage would be withdrawn under the **no wilderness/no action alternative**.

Effects on Vegetation

Areas designated wilderness would not be subject to most surface disturbing activities. Vegetation dependent upon the existing undeveloped environment would thus be maintained.

Table 5. Economic Value and Local Personal Income Generated Annually, Existing Program, Aldrich Mountain WSA (OR-2-103) (1981 price levels)

Resource Output	Unit of Measure	Quantity	Economic Value	Local Personal Income Generated
Grazing	AUM	231	$1,742	$1,933
Recreation (incl. hunting)	RVD	Unknown	Unknown	Unknown
Timber	MBF	76	8,855	18,240
Oil and gas leases	Acres	1,635	1,635	492
Total			12,232	20,665

The **no wilderness/no action alternative** would allow selective harvest of commercial timber on 1,082 acres. It is expected that timber harvest under the no wilderness/no action alternative would allow a more rapid advancement of ecological succession toward climax. This would occur through the removal of ponderosa pine (a mid-succession species) with regrowth in the area of both Douglas fir and grand fir (climax species).

Effects on Wildlife

Wildlife habitat would be preserved in areas designated wilderness.

Proposed habitat improvement projects, such as the five 20-acre burns and the two wildlife guzzlers, might or might not be allowed under the **all wilderness alternative**, depending on a site-specific assessment of whether they conform with Wilderness Management Policy.

Under the **no wilderness/no action alternative**, the proposed habitat improvement projects would be implemented and all 388 acres of old growth timber in the WSA would be subject to timber harvest. Species dependent upon old growth timber, such as the pileated woodpecker, would be displaced when harvest occurs in the old growth forest. Populations of cavity-nesting species such as saw-whet owls, flying squirrels, and flickers and nuthatchers would decline due to the loss of snags and potential snags, improving bighorn sheep habitat. Big game habitat could be adversely affected, however, as a result of surface disturbing activities which could occur. Depending on the extent and location of development, such activities could have a particularly adverse affect on bighorn sheep and elk.

Effects on Livestock Grazing

Under the **all wilderness alternative**, the proposed vegetative manipulation and seeding of 280 acres would not be allowed, and an opportunity to make available an additional 80 AUMs in the WSA would be foregone. The fence, 1 reservoir, and 1 spring development might or might not be allowed depending on a site-specific assessment to determine whether they conform with Wilderness Management Policy. If not allowed, an additional 99 AUMs in the WSA would be foregone. If none of the proposed improvements is constructed, there could be a reduction of 179 AUMs in licensed use in the study area and the allotment.

All of the livestock projects have a benefit/cost ratio greater than 1:1.

Also, under the all wilderness alternative, the interior ways would be closed restricting motor vehicle use by the grazing operator to the existing boundary roads, unless there were no practical alternative to using vehicles on the ways. Prohibiting vehicle use on the ways would likely inconvenience the grazing operator, because one of the ways is used to gain access to private lands adjacent to the WSA.

The **no wilderness/no action alternative** would allow for the development of all of the proposed livestock improvements, and an additional 179 AUMs would be realized.

Effects on Wood Products Harvest

Under the **all wilderness alternative**, there would be no timber harvest within the study area. This would result in a loss of 76,000 board feet (76 Mbf) per year for BLM's annual programmed harvest for the Burns district.

Under the **no wilderness/no action alternative**, timber harvest would be allowed, and there would not be any effect on the annual programmed harvest.

Effects on Recreation Use

Under the **all wilderness alternative**, the quality of and opportunities for primitive recreation would be maintained at their present level or improved. Improvements would occur as a result of the elimination of vehicle use on ways throughout the WSA.

Hunting would probably be most affected by the closing of vehicle ways. It is not expected that this would result in a substantial reduction in visitor use. Any reduction in hunter visitor days from the loss of vehicle-oriented hunting may be offset by increased use from hunters who do not use vehicles within their hunting area.

Although existing use of the area for primitive recreation is limited, it is expected that, with wilderness designation, such use would likely increase due to the attractiveness of the WSA. The expected increase in primitive recreation use may be sufficient to offset any loss of vehicle-oriented recreation due to the closure of ways. As a result, there would probably be no change in overall recreation use under the all wilderness alternative.

Under the **no wilderness/no action alternative**, primitive recreation would continue to be subject to disturbance from existing vehicle access routes and use.

There would be no significant impact to recreation under either alternative.

Effects on Economic Value and Local Income

The economic effects for the alternatives are presented in tables 6 and 7. Table 6 shows the effects on economic value and table 7, the effects on local personal income. It is not known at this time whether individual proposed structural developments would be constructed if the area were designated wilderness. It is known that vegetative manipulation projects would not be allowed.

The column for the all wilderness alternative shows the effects as a range of values dependent upon whether structural improvements were allowed.

Currently, there is little dependence on vehicles for livestock management in the study area. The all wilderness alternative would restrict such vehicle use unless there were no practical alternative. There would be no impact and no increase in costs to the grazing operator from road closures in the WSA.

Table 6. Effects of Alternatives on Annual Economic Value, Aldrich Mountain WSA (OR-2-103) (1981 price levels)

Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Timber	MBF	-76	0
Grazing			
Investment [1]	AUM	0 to +99	+179
Adjustment [2]	AUM	-179	-179
Oil and Gas Leases	Acres	-1,635	0
VALUE OF PLANNED INVESTMENTS [3]			
Grazing	$	0 to +746	+1,350
Investments [4]	$	0 to -1,509	-1,799
Net economic value [5]	$	-763 to 0	-499
VALUE OF OTHER EXPECTED CHANGES IN OUTPUTS			
Grazing Adjustment	$	-1,350	-1,350
Timber	$	-8,855	0
Oil and gas leases	$	-1,635	0
Total	$	-11,840	-1,350
VALUE OF TOTAL EXPECTED CHANGES IN OUTPUTS			
All categories [6]	$	-12,603 to -11,840 (-10,490)	-1,849 (0)

[1] Expected future increases due to range improvement investments.

[2] Adjustment for possible reduction in grazing is based on inconclusive data and may not be necessary.

[3] Vegetative manipulation projects involving up to $3,600 total expenditures, and structural projects involving up to $18,725. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Average annual cost of investment expenditures amortized at 7.875% over 50-year period.

[5] For alternatives reflecting a range of negative net values (i.e., investment costs exceeding benefits), the figures are reversed to show the larger negative value as the lower end of the range (e.g., -20 to 0) so that the summation of effects for all categories in each column will show the full range of potential effects.

[6] See footnote 2. If the grazing adjustment is found to be unnecessary, compensating improvements would not be developed. Investments and grazing adjustments would be zero. The effects of this case are shown in parentheses.

Table 7. Effects of Alternatives on Local Personal Income, Aldrich Mountain WSA (OR-2-103) 1981 price levels)

Item	Unit of Measure	All Wilderness	No Wilderness/ No Action
CHANGES IN RESOURCE OUTPUTS			
Timber	MBF	-76	0
Grazing			
Investment [1]	AUM	0 to +99	+179
Adjustment [2]	AUM	-179	-179
Oil and Gas Leases	Acres	-1,635	0
INCOME FROM PROPOSED INVESTMENTS [3]			
Grazing	$	0 to +829	+1,498
Construction activity [4]	$	0 to +2,511	+2,993
Total	$	0 to +829	+1,498
INCOME FROM OTHER EXPECTED OUTPUT CHANGES			
Grazing			
Adjustment	$	-1,498	-1,498
Timber	$	-18,240	0
Oil and gas leases	$	-492	0
Total	$	-20,230	-1,498
INCOME FROM ALL OUTPUT CHANGES			
All categories [5] [6]	$	-20,230 to -19,401 (-18,732)	0 (0)

[1] Expected future increases due to range improvements.

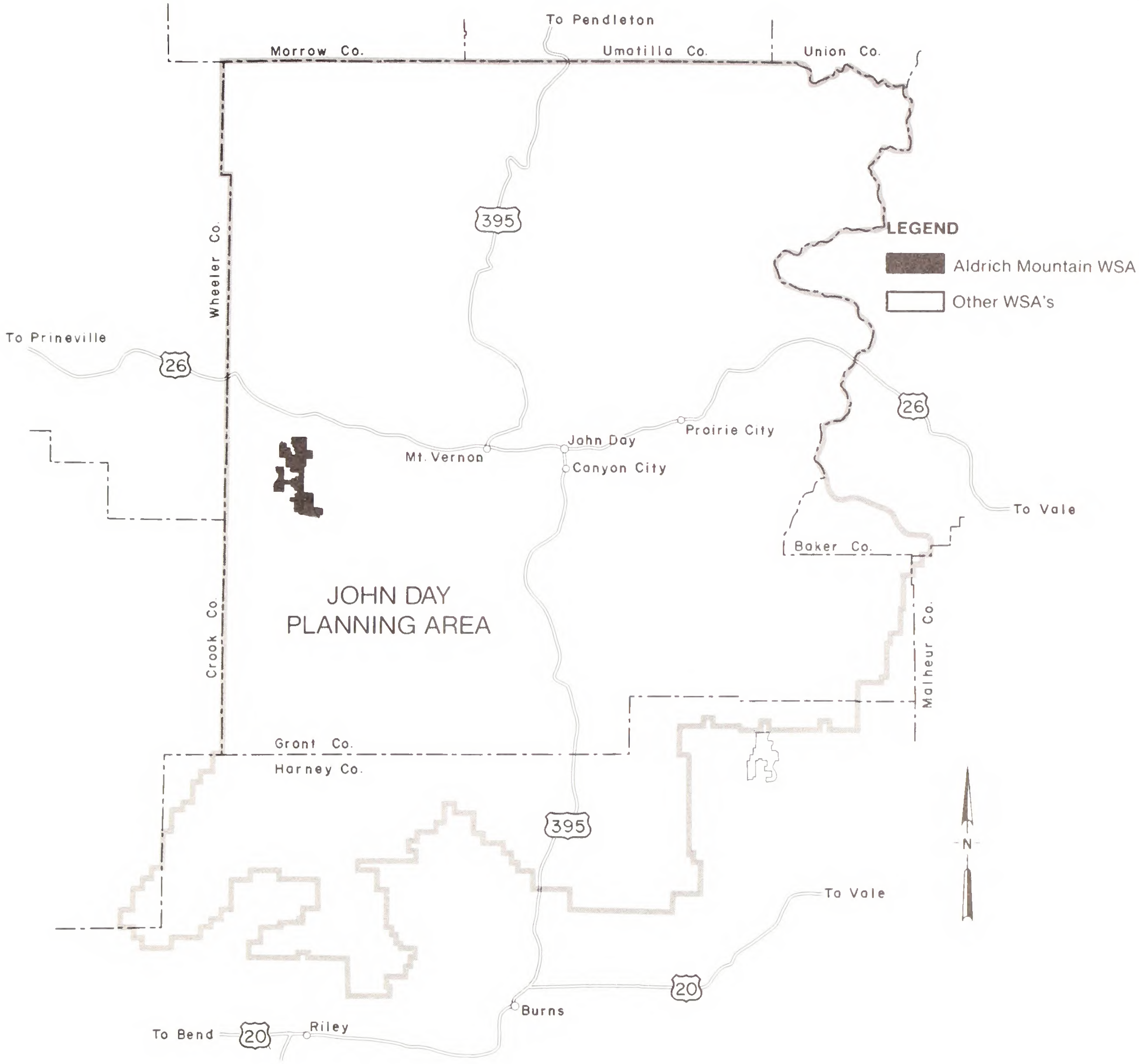
[2] Adjustment for possible reduction in grazing is based on inconclusive data and may not be necessary.

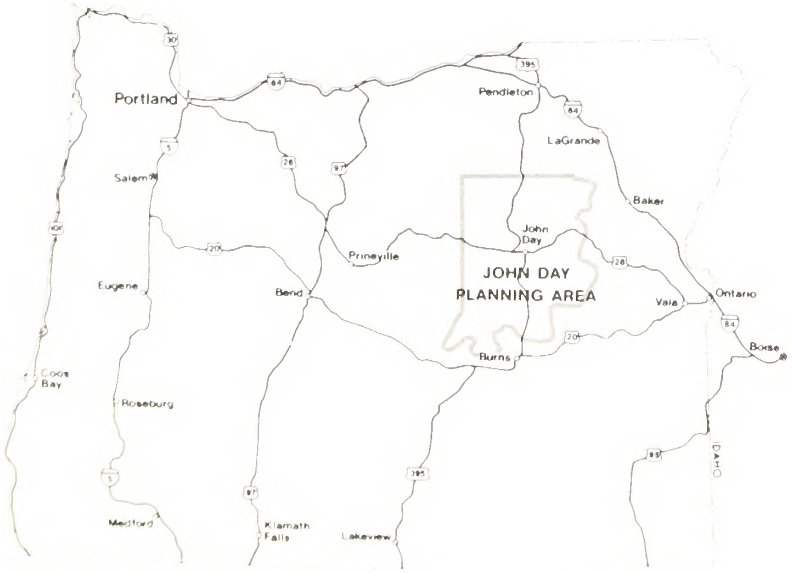
[3] Vegetative manipulation projects involving up to $3,600 total expenditures, and structural projects involving up to $18,725. Amounts shown in the table represent combined results of both types of projects, including construction and maintenance plus any added annual cost for management of herds and monitoring the allotment.

[4] Local personal income generated annually during assumed 5-year construction period. This amount cannot be added to the income resulting from timber harvest and grazing because it is not sustained over the analysis period.

[5] Total omits income from construction which is limited to 5-year period. See footnote 4.

[6] See footnote 2. If the grazing adjustment is found to be unnecessary, compensating improvements would not be developed. Investments and grazing adjustments would be zero. The effects of this case are shown in parentheses.





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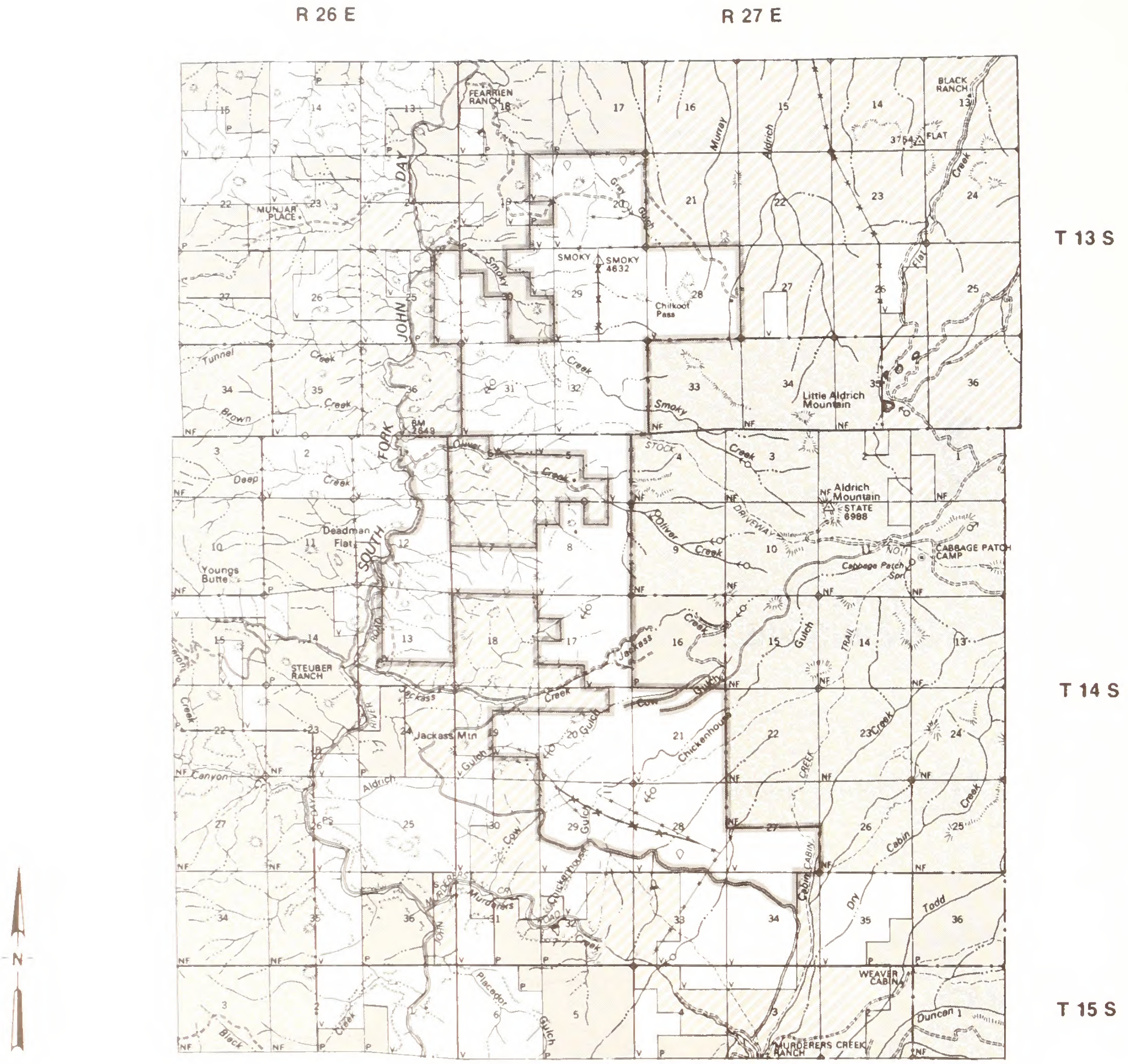
Bureau of Land Management
Burns District

Aldrich Mountain WSA
OR-2-103

LOCATION MAP

10 0 10 MILES

MAP 1



LEGEND

- Wilderness Study Area Boundary
- ☐ Bureau of Land Management
- ▨ State
- ▨ Private
- ▨ U.S. Forest Service

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Bureau of Land Management
Burns District

Aldrich Mountain WSA
OR-2-103

LAND OWNERSHIP

1 0 1 2 MILES

MAP 2

Aldrich Mountain WSA, OR-2-103. Just north of Oliver Creek looking toward the upper reaches of Oliver Creek. While the land on the left is within the study area, only a small portion of the timbered country in the drainage is in the WSA. The U.S. Forest Service and the State of Oregon manage most of the land in the drainage. Within the area recommended nonsuitable under the preferred (no wilderness/no action) alternative. September 1984.

Aldrich Mountain WSA, OR-2-103. Along the southern boundary road looking north. All of this view is within the study area and is recommended nonsuitable under the preferred (no wilderness/no action) alternative. August 1983.

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(June 1984)

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Oregon wilderness

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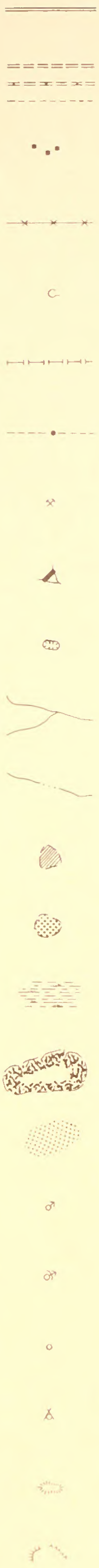
MAP SYMBOLS



Road

Ways

Buildings

Fence

Corral

Pipeline

Powerline

Mine or Quarry

Reservoir or Retention Dam

Earth Tank or Charco

Perennial Stream

Intermittent Stream

Intermittent Lake or Pond

Dry Lake or Pond

Marsh

Lava

Sand

Spring

Improved Spring

Well

Artesian Well

Peak

Rims